



Title	Studies on the Chironomid Midges Collected in Hokkaido and Northern Honshu
Author(s)	Sasa, Manabu; Suzuki, Hiroshi
Citation	熱帯医学 Tropical medicine 40(1). p9-43, 1998
Issue Date	1998-09-10
URL	http://hdl.handle.net/10069/4751
Right	

This document is downloaded at: 2012-10-12T15:05:01Z

Studies on the Chironomid Midges Collected in Hokkaido and Northern Honshu

Manabu SASA¹ and Hiroshi SUZUKI²

¹ *Institute of Environmental and Welfare Studies (Kankyou Fukushi Kenkyuusho), 135–3 Sunaba, Aramata, Kurobe-shi, 938–0001 Japan*

² *Institute of Tropical Medicine, Nagasaki University, Sakamoto, Nagasaki-shi, 852–8523 Japan*

Abstract: Collections of adult chironomids were conducted by H. Suzuki at 5 localities in southwestern Hokkaido in September, 1997, by M. Sasa in the Aizu area, Fukushima, in October, 1997, and by K. Kamimura in Aomori Prefecture in August 1997, by using light traps at night or by sweeping with insect net during daytime. The species identification was made after the specimens were individually mounted on slides in gum-chloral medium. In Hokkaido, 9 species were identified with specimens collected in the campus of Hokkaido University, 16 species including 5 new species at Ginzan, 14 species including 5 new species at Misumai, 8 species including 2 new species at Kyogoku, and 4 species at the foot of Mount Tarumae.

In the Aizu area, 2 species were identified with specimens collected on fluorescent lamps at Koriyama, 4 species, including a species belonging to *Protanypus*, a genus new to Japan, were collected on the shore of Lake Inawashiro and another 4 species, including a new species of a new subgenus, *Pseudosmittia* (*Hibarasmittia*) *hibaraundecima*, were collected on the shore of Lake Hibara. In Aomori Prefecture, 2 species, including a new species of genus *Macropelopia*, at Sukayu, 2 species at Asamushi, and 3 species at Fukaura, including a new species of genus *Tanytarsus*, were identified.

Key words: Chironomidae, taxonomy, new species, Hokkaido, northern Honshu

INTRODUCTION

Insects of the family Chironomidae, or the non-biting midges have recently been found to include large numbers of species, and have attracted interests of the environmental and medical scientists because of their great beneficial roles in cleaning freshwaters of lakes and rivers, and also in their usefulness as biological indicators of the degree of pollution, but at the same time causing serious environmental nuisance because of their massive emergence, and further acting as important causes of asthma and other allergic diseases by inhalation of the dusts originated from their dead bodies. The family has recently been shown to be

composed of large numbers of previously unknown species especially in Japan, and the numbers of species recorded from Japan by Sasa and coworkers from Japan, including the subtropical areas such as the Okinawa, Amami, Tokara and Ogasawara Islands, such as reviewed by Sasa and Kikuchi (1995) and Sasa (1998). Reports on the studies on Chironomidae in the tropical countries such as in Sumatra, Indonesia, were made by Kikuchi and Sasa (1990), and in Guatemala by Sublette and Sasa (1994). The present studies comprise the results of the surveys of Chironomidae collected in northern Honshu and Hokkaido, where still many previously unknown or new species were found to be distributed.

Hokkaido is an island located north of Honshu, the mainland of Japan, and is especially noted by the peculiar geographical distribution of some animal and plant species being different from Honshu, either indigenous or sometimes closer to that of Europe or Siberia. The chironomid fauna of Hokkaido were only poorly known before 1985, and only 2 species were recorded by Tokunaga (1938, 1940). Extensive studies of the chironomid fauna of Hokkaido was started by Sasa and coworkers in December, 1981. As the results, Sasa (1985) reported on the collection of 11 species (including 1 new species) from the Sapporo area, Sasa & Kamimura (1987) on 28 species including 11 new species and 6 species new to Japan from Akan area, Sasa (1988) on 53 species including 10 new species and 8 species new to Japan from southern areas of Hokkaido, and Sasa & Shirasaka (1988) on 9 species including 1 new species and 1 new genus from Abasiri area. A total of 79 chironomid species had been recorded from Hokkaido before this study, among which 33 were in common with Europe and the Palaearctic Region, 24 were in common with the mainland of Japan but not recorded from other regions, and 23 were only from Hokkaido Island.

Studies on the chironomid species in the Aizu area were conducted by Sasa (1993) with adult specimens collected in August 1991 on the shore of 5 lakes, and the results were recorded by Sasa (1993, pp. 69–95); 27 species (including 9 new species), were collected from Lake Hibara, 3 (1 new species) from Lake Akimoto, 3 (1 new species) from Lake Onogawa, 2 (2 new species) from Lake Goshikinuma, 7 (1 new species) from Lake Inawashiro, or 39 species (including 14 new species) in total. Studies on the chironomids in the Lake Towada area, Aomori, were also conducted in June-July 1989 by Sasa (1991), and a total of 29 species, including 10 new species, were recorded.

MATERIALS AND METHODS

The specimens of chironomids studied this time were mostly the adult males collected by light traps or with sucking tubes during nighttime, or by sweeping with insect net in daytime, preserved in 70% ethanol solution, and were mounted individually on slides in gum-chloral medium, mainly following the methods described in the monograph of Japanese Chironomidae compiled by Sasa & Kikuchi (1995). The methods of microscopic examination and standard measurements are also described in this literature.

Part A. The chironomid species collected in Hokkaido

1. The species collected in the campus of Hokkaido University, Sapporo, with a light trap on September 5, 1997

Chironomus nipponensis Tokunaga, 1936; 2 males; No. 348: 01, 02.

Paratendipes tamayubai Sasa, 1983; 1 male; No. 348: 03.

Cricotopus bimaculatus Tokunaga, 1936; 1 male; No. 348: 04.

Cricotopus polyannulatus Tokunaga, 1936; 1 male; No. 348: 05.

Cricotopus tokunagai Hirvenoja, 1973; 1 male; No. 348: 06.

Cricotopus triannulatus (Macquart, 1826); 1 male; No. 348: 07.

Parametriocnemus stylatus (Kieffer, 1924); 2 males No. 348: 08, 09.

Ablabesmyia monilis (Linnaeus, 1763); 1 male; No. 348: 10.

Conchapelopia japonica (Tokunaga, 1937); 1 male; No. 348: 11

Notes on the species collected in Sapporo

Paratendipes tamayubai Sasa, 1983

A male was collected; No. 348: 03. BL 4.44mm, WL 2.28mm, WW/WL 0.28. Ground color of scutum, and scutellum brown, stripes and postnotum dark brown, abdominal tergites brownish yellow; in the front leg, femur and tibia dark brown, tarsus I almost entirely white, tarsi II to V dark brown; middle and hind leg segments almost entirely yellowish brown. ER 0.24, AR 1.47, AHR 0.57, P/H 1.42, SO 14:14, CL 19, PN 3:3, DM 8, DL 8:9, PA 4:4, SC 11, SQ 16:16, RR 0.14, VR 1.27, R/Cu 1.10, fLR 1.30, mLR 0.61, hLR 0.63, fTR 0.22, fBR 2.6, mBR 4.3, hBR 3.4. Pulvilli vestigial. Anal point narrow, constricted at base and apically rounded. Dorsal appendage swan-shaped.

Remarks. This species was first recorded from a mountain stream running into Tama River, Tokyo, and also from Lake Toya, Hokkaido, by Sasa (1988).

Conchapelopia japonica (Tokunaga, 1937) (Fig. A1)

A male was collected. No. 348: 11. BL 4.62mm, WL 2.42mm, WW/WL 0.29. ER 0.41, AR 1.87, AHR 0.56. Palp very long, P/H 1.66. So 22:24, CL 21, PN 10:12, DM 50, DL 42:38, PA 18:21, SC 40. SQ 24:26 RR 0.47, VR 0.85, R/Cu 1.25. fLR 0.83, mLR 0.63, hLR 0.67, fTR 0.12, fBR 7.3, mBR 8.1, hBR 7.8. Body coloration (Fig. 1 a) characteristic to this species, *i.e.* scutum with two dark spots on each of median and lateral stripes (8 dark spots in total), postnotum with a pair of large dark spots, abdominal tergites I and II entirely pale, and III to VIII with a basal dark band; leg segments largely pale, but femora with an apical dark ring, tibiae with a basal and apical dark rings, tarsi entirely pale. Hypopygium in Fig. 1 b (left gonostylus omitted). Ninth tergites with an anal point-like process bearing microtrichia in the middle of posterior margin, and a pair of rounded lobes bearing short setae near its base. Gonocoxite with a prominent basal lobe (Also Fig. 1 c, left) bearing a long basolateral process, and long laterally directed apical setae. Gonostylus (also in Fig. 1 d, right) long and slightly curved, with a prominent megaseta.

Remarks. This species was recorded from Kyoto by Tokunaga (1937) with the name

of *Pentaneura japonica*, and was later recorded by Sasa (1991, 1993) and Sasa & Okazawa (1991, 1992) from Honshu. It is especially characteristic in the body coloration, and also in the structure of hypopygium. A detailed structure of hypopygium could be observed with the present specimen.

2. At Ginzan with a light trap on September 7, 1997

- Pentapedilum kasumiense* Sasa, 1979; 4 males; No. 347: 43–46.
Polypedilum ginzanprimum sp. nov.; 1 male; No. 347: 26; see Notes.
Polypedilum tamanigrum Sasa, 1983; 3 males; No. 347: 27–29; see Notes.
Polypedilum benokiense Sasa et Hasegawa, 1988; 1 male; No. 347: 31; see Notes.
Polypedilum arundineti Goetghebuer, 1929; 2 males; No. 347: 32, 33; see Notes.
Polypedilum japonicum (Tokunaga, 1938); 2 males; No. 347: 35, 36.
Polypedilum ginzansecundum sp. nov.; 4 males; No. 347: 37–40; see Notes.
Polypedilum ginzantertium sp. nov.; 1 male; No. 347: 41; see Notes.
Tanytarsus ginzanquartus sp. nov.; 5 males; No. 347: 48–52; see Notes.
Cricotopus metatibialis Tokunaga, 1936; 3 males; No. 347: 54–56.
Cricotopus bicinctus (Meigen, 1818); 4 males; No. 347: 57–60.
Paratrachocladus rufiventris (Meigen, 1830); 1 male; No. 347: 62.
Limnophyes minimus (Meigen, 1818); 1 male; No. 347: 63.
Smittia aterrima (Meigen, 1818); 1 male; No. 347: 64.
Corynoneura ginzanquinta sp. nov.; 1 male; No. 347: 67; see Notes.
Corynoneura lobata Edwards, 1924; 2 males; No. 347: 68, 69; see Notes.

Notes on species collected

Pentapedilum kasumiense Sasa, 1979

Four males were collected. No. 347: 43–46. BL 2. 76–2.86 (2.81 in average of 4) mm, WL 1.52–1.58 (1.55)mm, WW/WL 0.29–0.30. Body largely yellow, scutal stripes and postnotum brown. Wing entirely clothed by macrotrichia and without dark marks. ER 0.18–0.37 (0.29), AR 1.24–1.35 (1.28), AHR 0.53–0.59 (0.56), P/H 1.04–1.05, SO 10 or 12 (10.5), CL 13–21 (16.5), PN all 0, DM 11–19 (14.5), DL 11–14 (12.6), PA 4 or 5 (4.3), SC 6–8 (6.8), SQ 4–6 (4.4), RR 0.24–0.33 (0.30), VR 1.15–1.22 (1.20), R/Cu 1.07–1.13 (1.11), mLR 0.64. Anal point very stout, the shape of dorsal and ventral appendages characteristic to this species (see original description by Sasa, 1979).

Remarks. This species was originally collected as larvae from a ground pool near the shore of Lake Kasumigaura (Ibaraki), reared to pupae and adults, and was described as a new species. It was later recorded by Sasa & Okazawa (1991) from Toga (Toyama), and also by Sasa from an acid hotspring in Unzen (Nagasaki). This species is quite characteristic among the members of this genus in that anal point is very wide and apically rounded, and also in the shape of dorsal appendage. In the revised key to this genus prepared by Sasa (1998), it was stated that “anteprepronotum with 2–4 lateral setae, and lateral seta of dorsal appendage is arising from near base,” but such characters are seen only in the specimens collected at

Unzen, and in the type specimens and also in the present specimens anteprenotum without setae, and lateral seta of dorsal appendage arises from near the tip.

***Polypedilum (Polypedilum) arundineti* Goetghebuer, 1921 (Fig. A2)**

Two males were collected. No. 347: 32, 33. BL 3.46, 3.26mm. WL 1.52, 1.50mm, WW/WL 0.33, 0.31. ER 0.18, 0.21, AR 1.86, 1.78 (very high), AHR 0.56, 0.58, P/H 0.98, 0.96 (rather small), SO all 14, CL 18, 22, PN 0, DM 14, 14, DL 10:11, 9:10 (small), PA 4:4, 3:4, SC 7, 4 (very small) SQ 8:8, 9:10, RR 0.15, 0.20, VA 1.24, 1.25, R/Cu 1.18, 1.17, tarsi all lost. Anal point (Fig. 2 a) long and slender; dorsal appendage (Fig. 2 b) with lateral seta arising near the base; ventral appendage (Fig. 2 c) with only 6 recurved setae, and a long caudally directed apical seta.

***Polypedilum (Polypedilum) benokiense* Sasa et Hasegawa, 1988 (Fig. A3)**

A male was collected. No. 347: 31. BL 3.16mm, WL 1.62mm, WW/WL 0.36 (very wide). ER 0.18, AR 0.66 (lowest among the species), palp lost, SO 14:14, CL 20, PN 0, DM 23, DL 22: 22, PA 6:6, SC 16, SQ 20:20, RR 0.16, VR 1.38 (Very high), R/Cu 1.19, fLR 1.76, mLR 0.54, hLR 0.70, fTR 0.30, fBR 4.4, mBR 3.6, hBR 5.2. Anal point (Fig. 3 a) long, slender and parallel-sided. Dorsal appendage (Fig. 3 b) with a lateral seta arising at basal 1/3. Ventral appendage (Fig. 3 c) with 8 recurved setae and a long apical seta.

***Polypedilum (Polypedilum) tamanigrum* Sasa, 1983 (Fig. A4)**

Three males were collected. No. 347:27–29. BL 3.50, 3.28, 2.92mm, WL 1.82, 1.74, 1.60mm, WW/WL 0.33, 0.32, 0.35, ER 0.19, 0.14, 0.16, AR 0.75, 0.93, 0.73, AHR 0.41, 0.50, 0.48, P/H 1.07, 1.11, 1.22, SO 16:16, 12:12, 12:12, CL 15, 13, 12, PN all 0, DM 12, 16, 14, DL 16:18, 16:16, 14:16, PA 6:7, 6:6, 5:6, SC 24, 16, 16, SQ 16:16, 14:14, 21:20, RR 0.14, 0.14, 0.16, VR 1.21, 1.29, 1.32, R/Cu 1.17, 1.18, 1.17. fLR 1.66, mLR 0.53, 0.52, 0.52, hLR 0.68, 0.72, fTR 0.27, fBR 6.2, mBR 5.0, 7.0, 4.0, hBR 4.1, 3.4. Anal point (Fig. 4 a) long, slender and slightly tapering. Dorsal appendage (Fig. 4 b) with lateral seta arising at about middle. Ventral appendage (Fig. 4 c) with 12 recurved setae, and a long, caudally directed apical seta.

Remarks. This species was first recorded from a small mountain stream running into Tama River, and was found to be widely distributed in mountainous regions in Honshu, and was recorded also from Teine River, Hokkaido, by Sasa (1985). It can be differentiated from the related species by the structure of dorsal appendages (Fig. 4 b), being only slightly curved and not apically hooked, and with a lateral seta arising from distal half of the blade.

***Polypedilum (Polypedilum) ginzanprimum* sp. nov. (Fig. A5)**

A male was collected at Ginzan, Hokkaido, with a light trap on September 7, 1997. Holotype: No. 347: 26.

Male. BL 4.46mm, WL 2.24mm, WW/WL 0.30. Ground color of scutum, and scutellum yellowish brown, stripes and postnotum dark brown, abdominal tergites and femora

brown, tibiae yellowish brown, tarsi yellow. Head in Fig. 5 a. ER 0.20. Frontal tubercles absent. Antenna with 13 flagellar segments, AR 1.38, AHR 0.51. Palp long, P/H 1.19. SO 16:16, CL 24. Antepronotum (Fig. 5 b) separated, PN 0:0. Distribution of setae on scutum and scutellum in Fig. 5 c. DM 16, SO 14:14, PA 6:6, SC 26. Wing bare, unmarked, bluish, venation in Fig. 5 d. R2+3 almost in contact with R1, RR 0.18; VR 1.11, R/Cu 1.15. SQ 28:30, anal lobe nearly rectangular. Terminal scale of front tibia (Fig. 5 e) narrow, curved and apically pointed. One of the two terminal comb scales of middle and hind tibiae with a long spur, the other without spur (Figs. 5 f, g). Pulvilli well developed.

Hypopygium in Fig. 5 h. Anal point long, narrow, nearly parallel-sided, ninth tergite with 10 long setae in the middle portion and each 5 setae on both sides of posterior margin flanking anal point (Fig. 5 i). Bands of ninth tergite widely separated. Dorsal appendage (Fig. 5 j) composed of a high, nearly quadrangular base bearing a 3 long inner setae, and a rectangularly curved, nearly parallel-sided distal horn bearing a long seta at about middle of the lateral margin. Ventral appendage (Fig. 5 k) very long and tapering towards apex, with only 6 recurved setae and one long, caudally directed apical seta. Gonostylus widest at about middle, bearing two rows of 7 setae along inner margin.

Note. This specimen belongs to the *nubeculosum* group of the subgenus *Polypedilum*, since dorsal appendage is composed of a base bearing inner setae and the distal horn bearing one long lateral seta. However, the present species is especially characteristic in that base of dorsal appendage is very high, quadrangular and rectangularly produced backwards, and its distal horn is nearly parallel-sided and rectangularly curved, lateral seta is arising at about middle. It is somewhat related to *P. albicorne* (Meigen) among the species known from Europe, in that wing membrane is unmarked, abdomen uniformly dark, anal point is long and narrow, lateral seta of dorsal appendage arising in distal half, and gonostylus is rather slender, but it differs from the present species in that base of dorsal appendage is very low and the distal horn is nearly straight. Among the species recorded from Japan, *P. kunigamiense* Sasa et Hasegawa, 1988 is most closely related in body coloration, in the value of AR, and in the structure of head, wings and hypopygium, especially in that dorsal appendage is abruptly curved and its lateral seta is arising at about middle, but the latter again differs from the present species in that base of dorsal appendage is much lower as usual. In addition, 3 more species belonging also to the *nubeculosum* group of *Polypedilum* were collected at the same time, as shown in the following notes.

***Polypedilum (Tripodura) ginzansecundum* sp. nov.** (Fig. A6)

Four males were collected at Ginzan, Hokkaido, with a light trap on September 7, 1997. Holotype: No. 347: 37. Paratypes: No. 347: 38–40.

Male. BL 3.88–4.18 (4.02 in average of 4)mm, WL 2.02–2.20 (2.09)mm, WW/WL 0.32–0.34 (0.33). Body almost entirely pale yellow, scutal stripes hardly discernible. Head in Fig. 6 a. Eyes bare, ER 0.25–0.33 (0.30). Antenna with 13 flagellar segments, AR 1.72–1.88 (1.81), AHR 0.51–0.54 (0.53). Palp long, P/H 1.01–1.18 (1.06). So 14–17 (15.1), CL 13–16 (14.1). Antepronotum (Fig. 6 b) narrow, tapering towards middle and widely

separated by a U-shaped groove, without lateral setae. Distribution of setae on scutum and scutellum in Fig. 6 c. DM 16–22 (20.0), DL 12–18 (14.9), PA 4–6 (5.0), SC 18–23 (20.8).

Wing bare, without dark marks, venation in Fig. 6 d. SQ 12–16 (14.4), R2+3 almost in contact with R1, RR 0.09–0.19 (0.14), VR 1.23–1.27 (1.25), R/Cu 1.10–1.14 (1.12). Terminal scale of front tibia (Fig. 6 e) broad and nearly rectangular, without long setae. One of the two terminal comb scales of middle and hind tibiae with a long spur, the other without spur (Figs. 6 f, g). fLR 1.54–1.67 (1.61), mLR 0.54–0.58 (0.56), hLR 0.74–0.76 (0.75), fTR 0.27–0.36 (0.31), fBR 3.2–3.4 (3.3), mBR 3.6–5.1 (4.5), hBR 6.9–7.1 (7.0).

Hypopygium in Fig. 6 h. Anal point very broad and stout, widest at base and apically rounded, with a pair of lateral ridges and 5 pairs of short lateral setae. Ninth tergite bearing 22 long setae on the dorsal surface near the base of anal point. Dorsal appendage (Fig. 6 i) pad-like and nearly quadrangular, with a long seta arising at the posterior and lateral corner and a long seta arising from the basal and inner corner, and clothed with microtrichia on the posterior and inner half. Ventral appendage (Fig. 6 j) long and finger-like, bearing 14 long, recurved setae on the dorsal side of distal portion, and a very long caudally directed apical seta. Gonostylus long, widest at about distal 1/3, bearing short setae in two rows on inner margin.

Remarks. This species belongs to the subgenus *Tripodura* Townes, 1946, since the basic structures of head, thorax, wings, tibiae and hypopygium are the *Polypedilum* type, and the dorsal appendage is pad-like, clothed with microtrichia and bearing a long caudal seta but without bare, distal horn. The present species is especially characteristic in the shape of anal point being very broad and rounded, and the structure of dorsal appendage being quadrangular and bearing one long caudal seta and one long basomedial seta. It is therefore somewhat related to *P. scalaenum* (Schrank, 1803) recorded from Europe and also from Hokkaido by Sasa (1985, 1988), especially in that wing without dark marks, in the shape of anal point being stout, and in the structure of dorsal appendage, but the latter differs from the present species in that anal point is constricted at base (widest at base in the present species), with a pair of narrow and pointed processes at the base of anal point (this is absent in the present species), dorsal appendage with several long setae on posterior margin (they are absent in the present species), and in the absence of basomedial setae present in this species.

***Polypedilum (Uresipedilum) ginzantertium* sp. nov.** (Fig. A7)

A male was collected at Ginzan, Hokkaido, with a light trap on September 7, 1997. Holotype: No. 347: 41.

Male. BL 3.78mm, WL2.01mm, WW/WL 0.31. Body almost entirely yellow. Head in Fig. 7 a. Frontal tubercles absent. Eyes bare, ER 0.35. Antenna with 13 flagellar segments, AR 1.74, AHR 0.54. P/H 1.04. SO 16:16, CL 13. Anteprenotum widely separated, PN 0:0. Distribution of setae on scutum and scutellum in Fig. 7 b. DM 14, DL 12:14, PA 4:6, SC 13. Wing bare, without dark marks, SQ 10:14, anal lobe nearly rectangular, venation in Fig. 7 c. R2+3 in contact with R1; VR 1.28, R/Cu 1.11. Terminal scale of front tibia (Fig. 7 d) broad and rounded. Terminal comb scales of middle and hind tibiae in Figs. 12 e, f, one with a long

spur, the other without spur. Front tarsi both lost. mLR 0.56, hLR 0.80, mBR 4.7, hBR 8.4. Pulvilli large, brush-like.

Hypopygium in Fig. 7 g (the contours of both dorsal appendages under the ninth tergite are illustrated). Anal point (lateral view) narrow and hornlike. Dorsal appendage (Fig. 7 h) composed of a high base bearing 2 inner setae, 1 long caudal seta, and with a rectangularly curved inner horn. Ventral appendage (Fig. 7 i) expanded distally but tapering towards sharply pointed apex, with 24 recurved setae and a long caudally directed apical seta. Gonostylus widest at about middle, with long setae on inner margin.

Remarks. This specimen is a typical member of the subgenus *Uresipedilum* in the structure of dorsal appendages being composed of a long and broad pad clothed with microtrichia, and a bare inner process. Its anal point is different from the previously known species of this subgenus in that it is not broad such as in *P. aviceps*, 1946, or not slender and pale such as in *P. cultellatum*, but is strongly chitinized, curved and pigmented. Its dorsal appendage is entirely covered by microtrichia and with only one long posterior seta such as in *P. convictum*, but its inner process is not straight but rectangularly curved, a quite unusual structure as a member of this subgenus.

***Tanytarsus ginzanquartus* sp. nov.** (Fig. A8)

Five males were collected a Ginzan on September 7, 1997. Holotype: No. 347: 48. Paratypes: No. 347: 49–52.

Male. BL 2.48–2.78 (2.66 in average of 5) mm, WL 1.50–1.54 (1.52) mm, WW/WL 0.29–0.30. Body almost entirely pale, slightly yellowish. Head in Fig. 8 a. Frontal tubercles absent. Eyes bare, ER 0.22–0.32 (0.26). Antenna with 13 flagellar segments, AR 0.69–0.87 (0.78), AHR 0.42–0.47 (0.45). P/H 1.02–1.31 (1.17). So 4 or 6 (5.6), CL 12 or 14 (13.2). Antepnotum (Fig. 8 b) tapering towards middle and widely separated, PN all 0. DM 8–15 (11.), DL 7–9 (8.2), PA all 1, SC 4–7 (5.6). Wing almost entirely clothed with macrotrichia, SQ 0, anal lobe nearly flat, venation in Fig. 8 c. RR 0.24–0.34 (0.29), VR 1.44–1.57 (1.50, very high), R/Cu 1.04–1.10 (1.06). Tip of front tibia (Fig. 8 d) with a narrow, sharply pointed terminal scale. Tips of middle and hind tibiae (Figs. 8 e, f) with 2 separated terminal comb scales, both with a spur. fLR 2.23 (front tarsi left only in one specimen), mLR 0.58–0.62 (0.60), hLR 0.68–0.76 (0.72), mBR 5.1–6.4 (6.0), hBR 6.4. Pulvilli absent.

Hypopygium in Fig. 8 g. Anal point (Fig. 8 h) long, narrow, slightly constricted in the middle, with lateral ridges but without spine clusters. Bands of ninth tergite separated. Dorsal appendage (Figs. 13 j, k) roughly elongate oval, with 6 lateral and 2 inner setae on dorsal side, and a long basal seta on ventral side at the base of digitus. Digitus (Fig. 8 j) about twice as long as wide and inner margin rounded. Median appendage (Fig. 8 k) composed of a long shaft bearing simple setae on inner side, and a short basal branch bearing some 8 setae. Ventral appendage (also in Fig. 8 k) slightly expanded distally, shorter than median appendage, bearing 10 recurved setae.

Remarks. These specimens are considered as belonging to the *usmaensis* group of genus *Tanytarsus*, since anal point with lateral ridges but without spine cluster, but is quite

characteristic in the structure of dorsal appendage, digitus, and median appendage. It differs from *T. usmaensis* Pagast, 1931, in that anal point is bare (in the latter, anal point with lateral setae and dorsal spines). It is somewhat related to *T. uresiacutus* Sasa, 1989, in that anal point is bare and bands of ninth tergite are separated, but the latter essentially differs from the present species in the structure of the above appendages of hypopygium.

***Corynoneura ginzanquinta* sp. nov.** (Fig. A9)

A male was collected on September 7, 1997, with a light trap, at Ginzan, Hokkaido. Holotype: No. 347: 69.

Male. BL 1.58mm, WL 0.96mm, WW/WL 0.42. Head in Fig. 9 a. Eyes pubescent, reniform, ER 1.62. Antenna with 12 flagellar segments, AR 0.53, AHR 0.38, last segment with a group of short and curved sensory setae in the apical portion, and a group of long setae arising from the basal portion and the tips reaching to beyond tip of the segment. Palp short, P/H 0.73. SO 0:0, CL 4. Anteprenotum (Fig. 9 b) united in the middle, without seta. Distribution of setae on scutum and scutellum in Fig. 9 c. DM 0, DL 9:10, PA 3:3, SC 2. Wing in Fig. 9 d. Squama bare, VR 0.53, R/Cu 0.31. Tips of front and middle tibiae in Figs. 14 e, f. Tip of hind tibia (Fig. 9 g) slightly expanded, with 2 spurs and a comb composed of 14 free spurs. Tip of middle tarsus I (Fig. 9 h) with 2 apical and 2 preapical spurs. Front tarsi lost; mLR 0.72 (unusually high), hLR 0.67, mBR 3.0, hBR 2.8.

Distribution of setae on abdominal tergites in Fig. 9 i. Tergites I and III with 6 setae, II and VI to VII with 4 setae, VII and IX with 2 setae. Hypopygium in Fig. 9 j. Ninth tergite with a large, hyaline, apically rounded anal point in the middle of posterior margin. Gonocoxite with a large rounded inner lobe near the tip of posterior margin. Gonostylus widest about middle, inner margin convex and tapering towards apex, with a long megaseta but without preapical tooth.

Remarks. The above structures and measurement data indicate that this specimen is a typical member of the tribe Corynoneurini, and belonging to the genus *Corynoneura* Winnerts 1846, since tip of hind tibia is expanded. However, it is quite unusual as a member of this genus and represent a new species since eyes are pubescent, abdominal tergites I to VII bears 4 or 6 setae, and hypopygium bears a large hyaline, anal-point like process. According to Cranston *et al.* (1989), the known species of this genus have bare eyes, with only 1 or 2 setae on abdominal tergites, and ninth tergite without anal point. The present species belongs to the group with a group of short sensory setae on the tip of antenna, and with long setae on the last antennal segment, with a large inner lobe on gonocoxite, and gonostylus is apically curved and tapered.

***Corynoneura lobata* Edwards, 1924**

Two males provisionally identified as this species were collected. No. 347: 67, 78. BL 1.04, 1.34mm, WL 0.70, 0.74mm, WW/WL 0.46, 0.45. Eyes bare, ER 1.71, 1.93. Antenna with only 10 flagellar segments, AR 0.35, 0.37. Palp very short, P/H 0.42, 0.41. SO 0, CL 4, 4. Anteprenotum united in the middle, without lateral seta. DM 0, DL 5:5, 5:6, PA all 2, SC

2, 2. Wing venation typical as a *Corynoneura* species, VR 0.30, 0.30, R/Cu 0.29, 0.28. fLR 0.55, mLR 0.63, hLR 0.53, 0.54, fTR 0.13, fBR 3.1, mBR 2.8, hBR 3.1.

3. At Misumai by sweeping with insect net, on September 6, 1997

Chironomus nipponensis Tokunaga, 1936; 4 males; No. 348: 23–26.

Chironomus yoshimatsui Martin et Sublette, 1972; 2 males; No. 348: 27, 28.

Paracladopelma camptolabis (Kieffer, 1913); 1 male; No. 348: 29.

Paracladopelma misumaiprima sp. nov.; 3 males; No. 348: 30–32; see Notes.

Paracladopelma misumaisecunda sp. nov.; 1 male; No. 348: 33; see Notes.

Polypedilum asakawaense Sasa, 1980; 4 males; No. 348: 36–39; see Notes.

Polypedilum misumaitertium sp. nov.; 1 male; No. 348: 40; see Notes.

Polypedilum misumaiquartum sp. nov.; 2 males; No. 348: 41, 42; see Notes.

Stictochironomus pictulus (Meigen, 1830); 2 males; No. 348: 34, 35; see Notes.

Tanytarsus misumaiquintus sp. nov.; 5 males; No. 348: 43–47; see Notes.

Cricotopus osaruquartus Sasa, 1988; 5 males; No. 348: 48–52.

Cricotopus tokunagai Hirvenoja, 1973; 2 males; No. 348: 53, 54.

Paratrichocladus rufiventris (Meigen, 1830); 1 male; No. 348: 54.

Rheopelopia maculipennis (Zetterstedt, 1838); 1 male; No. 348: 55; see Notes.

Notes on the species collected at Misumai

Paracladopelma camptolabis (Kieffer, 1913)

A male was collected. No. 348: 29. BL 3.50mm, WL 1.70mm, WL 1.70mm, WW/WL 0.28, ER 0.36, AR 1.71, AHR 0.61, P/H 1.14, SO 20:20, CL 12, PN 3:3, DM 10, DL 7:9, PA 3:3, SC 9, SQ 5:5, RR 0.21, VR1.26, R/Cu 1.12, mLR0.62, hLR0.67, hBR 5.1.

This species was first recorded from Japan by Sasa (1984) from Lake Chuzenji (Tochigi) with descriptions of male and pupa, later at several localities in Honshu and also by Sasa (1988) from Lake Toya, Hokkaido. The structures of dorsal and ventral appendages are quite different from the following two species.

Paracladopelma misumaiprima sp. nov. (Fig. A10)

Three males were collected by sweeping at Misumai, Hokkaido, on September 6, 1997. Holotype: No. 348: 30. Paratypes: No. 348: 31, 32.

Male. BL 5.74, 5.98, 5.62mm, WL 2.74, 2.92, 2.62mm, WW/WL 0.28, 0.27, 0.28. Ground color of scutum and scutellum white, stripes and postnotum brown, abdominal tergites slightly yellowish, hypopygium brown; all femora yellow, tibiae and tarsi of front legs brown, tibiae of middle and hind legs yellow and each with a basal dark mark, tarsi of middle and hind legs entirely yellow.

Head in Fig. 10 a. Eyes bare, ER 0.23, 0.20, 0.24. Antenna with 11 flagellar segments, AR 2.82, 2.83, 3.09 (very high), AHR 0.53, 0.60, 0.56. Frontal tubercles (Fig. 10 b) small, longer than wide and spindle-shaped. Palp long, P/H 1.36, 1.48, 1.35. SO 18:20, 16:16, 16:16, CL 14, 16, 18. Anteprepronotum (Fig. 10 c) united in the middle, with 3:3, 3:4, 5:6 lateral setae.

Distribution of setae on scutum and scutellum in Fig. 10 d, DM 17, 21, 21, DL 11:17, 13:16, 14:15, SC 20, 23, 23.

Wing bare, bluish, venation in Fig. 10 e. Anal lobe nearly rectangular, SQ 14:16, 16:18, 8:9. Costa not extended, RR 0.24, 0.20, 0.14, VR 1.10, 1.09, 1.16, R/Cu 1.13, 1.12, 1.11. Terminal scale of front tibia (Fig. 10 f) broad and rounded, terminal comb scales of middle and hind tibiae (Figs. 15 g,h) separated and both with a spur. fLR 1.65, 1.57, 1.73, mLR 0.68, 0.70, 0.69 (all very high), hLR 0.68, 0.67, 0.73, fTR 0.23, 0.23, 0.22, fBR 2.6, 2.4, 2.8, mBR 5.1, 3.7, 5.4, hBR 5.3, 4.0, 5.8. All legs with a pair of large pad-like pulvilli (Fig. 10 i).

Hypopygium in Fig. 10 j. Anal point long, narrow and parallel-sided, with 5 setae on both sides of the base. Dorsal appendage (Fig. 10 k) thumb-like and slightly expanded medially, with 3 long terminal setae and clothed with microtrichia except for the basal and lateral portion. Ventral appendage (Fig. 10 m) almost entirely hidden under dorsal appendage, shorter and narrower, and with 2 long terminal setae. Gonostylus widest at base and tapering towards pointed apex, with a short apical seta and short setae along inner margin.

Remarks. These specimens belong to the genus *Paracladopelma* Harnisch, 1923, since the genal structure is typical as a member of the *Harnischia* complex of the tribe Chironomini, antenna with 11 flagellar segments, both dorsal and ventral appendages of gonocoxite are simple, short, pad-form and covered by microtrichia. A total of 11 species have been recorded as members of this genus from Japan, among which only *P. camptolabis* has the Holarctic distribution and the rest 10 species are considered as species indigenous to Japan. Among the known species of this genus, the present one seems to be somewhat related to holarctic species *P. camptolabis* Kieffer, 1913, in that dorsal appendage is expanded, gonostylus not constricted, and ventral appendage is apically rounded. The present species is also closely related to *P. tokaraefea* Sasa et Suzuki, 1995 recorded from the Tokara Islands, southern Japan, in that both dorsal and ventral appendages are simple and bearing long setae, but the latter differs from the present species in that antepronotum without lateral setae and in the structure of dorsal and ventral appendages.

***Paracladopelma* sp. “misumaisecunda” (Fig. All)**

A male was collected. No. 348: 32. This specimen also belongs to the genus *Paracladopelma* Harnisch, 1923, and the structures of anal point, dorsal and ventral appendages are as in Fig. 11 a. The standard measurement data are BL 5.60mm, WL 2.88mm, WW/WL 0.26, ER 0.31, AR 2.67, AHR 0.69, SO 22:22, CL 16, PN 6:6, SC 24, SQ 9:14, RR 0.20, VR 1.10, R/Cu 1.11, fLR 1.75, mLR 0.66, hLR 0.68, fTR 0.27, fBR 2.2, mBR 3.8, hBR 5.2.

These structures and measurement data are mostly similar to those of the preceding species, but the ventral appendage is longer, narrower and bearing no long setae, the dorsal appendage is also narrower, bearing also 3 apical setae but microtrichia are longer and distributed to only the inner half, the lateral half bare; the frontal tubercles are much smaller. This species is also similar to *P. pugna* Kawai, 1991, in the shape of gonostylus being widest at base and tapering towards pointed apex, but the latter differs from the present species in

that dorsal appendages are entirely clothed with microtrichia, AR is much smaller (1.09), scutellar setae are fewer (16), and squama with only 1 fringe hair, according to the original description. The scientific name is reserved until additional specimens become available.

***Polypedilum (Polypedilum) asakawaense* Sasa, 1980** (Fig. A12)

Four males were collected by sweeping at Misumai. No. 348: 36–39. BL 4.06–4.52 (4.22 in average of 4)mm, 2.14–2.41 (2.25)mm, WW/WL 0.29–0.31 (0.30). ER 0.12–0.26 (0.30), AR 1.75–2.00 (1.92), AHR 0.45–0.48 (0.47; these values are unusual in species with $AR > 1.0$), P/H 1.04–1.24 (1.16), SO 12–16 (13.5), CL 23–32 (26.8). Anteprenotum widely separated and PN all 0. DM 8–13 (11.0), DL 9–13 (11.1), PA all 3, SC 12–16 (13.8).

Wing bare, bluish, SQ 10–14 (11.9). R2+3 almost in contact with R1, RR 0.09–0.15 (0.12), VR 1.23–1.29 (1.27), R/Cu 1.16–1.18 (1.17). fLR 1.56–1.57, mLR 0.57–0.61 (0.59), hLR 0.76–0.80 (0.79), fTR 0.29–0.30, fBR 3.3–4.5 (3.9), mBR 3.0–7.0 (4.9), 5.7–8.3 (7.3). Pulvilli well developed.

Hypopygium in Figs. 12 a, b, c. Anal point widest at base and tapering towards rounded apex, with 10 lateral setae, and covered by microtrichia except in the distal portion. Dorsal appendages (Fig. 12 b, left; Fig. 12 c, right) rectangularly curved and slightly hooked apically, without lateral and basal setae. Ventral appendage (Fig. 12 c) finger-like, with 18 recurved setae on distal portion and a long, caudally directed apical seta. Gonostylus widest at about basal 1/3, inner margin nearly straight and apically pointed.

This species was first recorded from upstream sites of Minamiasakawa River (Tokyo), and later from a number of lakes and rivers in Honshu, but this is the first record from Hokkaido. It belongs to the *nubifer* group of subgenus *Polypedilum*, and is especially characteristic in the shape of dorsal appendage, being long, rectangularly curved and without lateral seta. It should be noted that a specimen with almost the same structure and measurement data but with a long lateral seta was collected at the same time, as described next.

***Polypedilum (Polypedilum) misumaitertium* sp. nov.** (Fig. A13)

A male was collected on September 6, 1997. Holotype: No. 348: 40.

Male. BL 4.1mm, WL 2.17mm, WW/WL 0.31. Ground color of scutum, and scutellum yellow, stripes slightly brownish but hardly discernible, scutum with a pair of brown spots posterior to the lateral stripes and in the caudolateral corners (Fig. 13 c), legs almost uniformly pale yellow, abdominal tergites brown (such a pattern is quite the same as in the above species, *P. asakawaense*). Head in Fig. 13 a. Frontal tubercles absent. ER 0.28, AR 1.78, AHR 0.58. (this is larger than in the above species, and is usual in the species with $AR > 1.0$); P/H 1.06, SO 12:12, CL 27. Anteprenotum (Fig. 13 b) widely separated, PN 0:0. Distribution of setae on scutum and scutellum in Fig. 13 c, DM 9, DL 12:12, PA 4:4, SC 10.

Wing bare, bluish, venation in Fig. 13 d. SQ 10:10, R2+3 in contact with R1, RR 0.14; VR 1.28, R/Cu 1.17. Tip of front tibia (Fig. 13 e) with a broad and apically pointed scale. Terminal scales of middle and hind tibiae (Figs. 18 f,g) contiguous, and with only one long spur. fLR 1.53, mLR 0.61, hLR 0.73, fTR 0.28, fBR 4.3, mBR 4.4, hBR 7.8. Pulvilli well

developed.

Hypopygium in Fig. 13 h. Anal point (also in Fig. 13 i) widest at base and tapering towards rounded apex, with 6 lateral setae on both sides, clothed with microtrichia except in the apical portion. Dorsal appendages (Figs. 13 j,k) long and rectangularly curved and without basal seta like in the above species, but with a long lateral seta arising at about middle. Ventral appendage (Fig. 13 m) with 18 recurved setae arising from distal half, and a long, caudally directed apical seta. Gonostylus widest at about basal 1/3, inner margin almost straight but lateral margin abruptly constricted near apex.

Remarks. This specimen is closely related in the structures, measurement data and body coloration to the above species, *P. asakawaense* Sasa, 1980, and the only significant difference is found in the presence of a long lateral seta on both dorsal appendages. However, the presence or absence of the lateral seta on dorsal appendage has been regarded as the key character separating the *nubeculosum* groups group from the *nubifer* group within the subgenus *Polypedilum* (Sasa & Kikuchi, 1995, p.112). Therefore, this specimen is provisionally regarded as a new species different from *P. asakawaense*. It should also be noted that the two very common and cosmopolitan species, *P. nubifer* (Scuse, 1889) and *P. nubeculosum* (Meigen, 1804), is very closely related in body coloration and the structure of hypopygium, especially in the shape of dorsal appendage and gonostylus, but differs in the absence or the presence of the lateral seta of dorsal appendage and antepnotum.

***Polypedilum (Polypedilum) misumaiquartum* sp. nov.** (Fig. A14)

Two males were collected at Misumai on September 6, 1997, by sweeping with insect net. Holotype: No. 348: 41. Paratype: No. 348: 42.

Male. BL 4.92, 5.28mm, WL 2.62, 2.67mm, WW/WL 0.30, 0.31. Scutum almost entirely dark brown, scutellum brown, postnotum dark brown, abdominal tergites yellow; front femur and tibia entirely brown, middle and hind femora largely brown and each with slightly paler ring in the subapical portion, all tibiae brown, all tarsi entirely yellow (such a body coloration is quite peculiar to this species).

Head in Fig. 14 a. Eyes bare, ER 0.17, 0.21. Antenna with 13 flagellar segments, AR 1.17, 1.08 (relatively small), AHR 0.52, 0.53. Palp long, P/H 1.32 1.35. SO 20:20, 28:30, CL 30, 20. Antepnotum (Fig. 14 b) widely separated by a U-shaped groove, PN all 0. Distribution of setae on scutum and scutellum in Fig. 14 c; DM 20, 24, DL 20: 21, 24:24, PA 6:8, 9:10, SC 36, 30.

Wing bare, bluish, very finely granular, venation typical as a member of *Polypedilum*. SQ 20:22, 18:20. R2+3 almost in contact with R1, RR 0.17, 0.15; VR 1.16, 1.21, R/Cu 1.13, 1.15. Terminal scale of front tibia (Fig. 14 d) broad and apically pointed. Terminal comb scales of middle and hind tibiae (Figs. 14 e,f) contiguous and with one long spur. fLR 1.49, 1.53, mLR 0.55, 0.55, hLR 0.71, 0.72, fTR 0.25, 0.26, fBR 3.8, 3.3, mBR 5.2, 6.6, hBR 6.2, 8.3. Pulvilli well developed.

Hypopygium in Fig. 14g. Ninth tergite longer than wide and bearing 18 long setae in the middle portion, and 5 short setae on both sides of the base of anal point. Anal point

rather stout, long and parallel-sided. Dorsal appendage (Fig. 14 h) with a narrow base bearing 2 basal setae, distal horn smoothly curved, apically hooked, with a long lateral seta arising at about distal 1/3. Ventral appendage (Fig. 14 i) very long and narrow, bearing 20–22 recurved setae arising from near base to the tip, and a long apical seta. Gonostylus long and slender, inner margin almost straight and bearing long setae, with pointed apex.

Note. These specimens belong to the *nubeculosum* group of subgenus *Polypedilum*, since dorsal appendage bears a long lateral seta, and somewhat related to *P. pedestre* (Meigen) among the holarctic species, in that abdomen is pale, ninth tergite is acutely triangular, and anal point is long and slender, but the latter differs from the present specimens in that AR is smaller than 1.0, anal point is tapering towards pointed apex, lateral seta of dorsal appendage arises at about 1/3 from the base, and in body coloration especially the scutal stripes being black. They are also somewhat related to *P. shoufuscum* Sasa, 1989 among the Japanese species, in that lateral seta arising at about distal 1/4, but in the later AR is 1.80 (much higher), thorax and abdomen are largely black, and legs are uniformly brown.

***Stictochironomus pictulus* (Meigen, 1830) (Fig. A15)**

Two males were collected. No. 348: 34, 35. BL 7.26, 6.94mm, WL 3.20, 3.00mm, WW/WL 0.27, 0.30. Scutum and postnotum entirely black, scutellum brown, abdominal tergites largely black but each tergite with a pale band along posterior margin. Legs with conspicuous dark and pale rings (Fig. 15 e); femora largely dark and with a short preapical pale ring; tibiae with 3 dark rings and 2 pale rings; tarsi I largely pale and with 2 short dark median and apical rings; tarsus II and III largely pale and with an apical dark ring; tarsi IV and V brown.

Head in Fig. 15 a. Frontal tubercles absent. Eyes bare, ER 0.16, 0.21. Antenna with 13 flagellar segments, AR 2.54, 2.70, AHR 0.56, 0.53. Palp long, P/H 1.14, 1.18. SO 20:20, 20:20, CL 40, 40. Anteprepronotum (Fig. 15 c) separated in the middle by a V-shaped groove, PN 0:0, 0:0. Distribution of setae on scutum and scutellum in Fig. 15 c; DM 28, 25, DL 18:22, 15:16, PA 6:6, 6:7, SC 32, 28.

Wing bare, with 4 dark spots, venation in Fig. 15 d; RR 0.42, 0.47 (larger than in most species of subgenus *Polypedilum*), VR 0.90, 0.90 (unusually small), R/Cu 1.17, 1.17. Coloration and relative length of leg segments in Fig. 15 e (F; front, M: middle, H: hind leg). Terminal scale of front tibia (Fig. 15 f) broad and rounded, bearing 3 long setae. Terminal comb scales of middle and hind tibiae (Figs. 15 g, h) contiguous and with one spur. fLR 1.16, 1.14 (unusually small as a member of Chironominae), mLR 0.61, 0.61, hLR 80, 74, fTR 0.23, 0.23, fBR 3.2, 4.7, mBR 3.4, 4.8, hBR 5.6, 6.7. Tip of legs with a pair of simple claws, an empodium, and a pair of large brush-like pulvilli (Fig. 15 i, hind leg).

Hypopygium in Fig. 15 j. Anal point long, narrow and tapering towards rounded apex. Dorsal appendage (Fig. 15 k) composed of a narrow base bearing 4 inner setae, and a narrow, apically hooked and pointed distal horn bearing a long lateral seta arising at near the tip. Ventral appendage (Fig. 15 m) long, finger like, bearing 20–23 recurved setae and a long caudally directed apical seta. Gonostylus shorter than gonocoxite, inner margin almost

straight and bearing short setae in two rows.

Remarks. This species has a holarctic distribution, and its presence in Japan was recorded by Yamamoto (1980). The above stated structures and measurement data largely fit to the description of *S. pictulus* (Meigen, 1830) of the European workers.

***Tanytarsus shoucygneus* Sasa, 1989 (Fig. A16)**

Five males were collected. No. 348: 43–47. BL 2.62–2.96 (2.83 in average of 5)mm, WL 1.24–1.63 (1.48)mm, WW/WL 0.29–0.31 (0.30). Head in Fig. 16 a. Small frontal tubercles present (Fig. 16 b), 8 microns long and 4 microns wide, 36 microns apart from each other. ER 0.44–0.67 (0.53), AR 0.75–0.91 (0.84), AHR 0.53–0.56 (0.54), P/H 1.03–1.31 (1.12), SO 8–14 (10.8), CL 12–16 (14.8), Atepronotum (Fig. 16 c) tapering towards middle and separated, PN 0, but without median groove such as seen in the *Polypedilum* complex (ref. Fig. 15 b). DM 8–14 (10.0), DL 6–7 (6.6), PA all 1, SC 4–6 (4.4).

Wing (Fig. 16 d) with macrotrichia on almost entire surface, squama bare, RR 0.43–0.49 (0.45), VR 1.09–1.24 (1.19), R/Cu 1.06–1.11 (1.08). Tip of front tibia (Fig. 16 e) with a narrow and sharply pointed scale. Tips of middle and hind tibiae (Figs. f, g) with two separated comb scales, both with a spur. fLR 2.47–2.79 (2.58, very high), mLR 0.57–0.59 (0.58), hLR 0.67–0.74 (0.70) fTR 0.38–0.39, fBR 3.8–3.9, mBR 2.5–4.8 (3.5), hBR 5.0–5.4 (5.2). Pulvilli absent.

Hypopygium in Fig. 16 h. Bands of anal tergite separated. Anal point (Fig. 16 i) with a very wide and triangular base, distal process without microtrichia, slightly constricted in the middle, with lateral ridges and 4 or 5 spine clusters between them, and with 3 pairs of lateral setae and 6 basal setae. Dorsal appendage (Fig. 16 j, ventral view; D in Fig. 16 k; dorsal view) inverted swan-shaped, *i. e.* composed of an oval base and a posterior head with concave inner margin and pointed apex, bearing 2 inner, 2 dorsal and 2 lateral setae, and a basal seta arising from a large triangular tubercle. Digitus (Di in Figs. 16 j,k) long, parallel-sided and apically rounded. Median appendage (M in Fig. 16 k) short, directed inwards, with several simple setae. Ventral appendage (V in Fig. 16 k) finger-like, with 8 recurved seate and 3 caudally directed apical setae. Gonostylus with slightly concave inner margin and convex lateral margin, with an apical seta and 10 short setae in two rows along inner margin.

Remarks. These specimens are provisionally identified as *T. shoucygneus* Sasa, 1989, originally recorded from Toyama, and is especially characterised by the shape of dorsal appendage and digitus, but are different from the original specimens in the following points; small frontal tubercles present (absent in the original specimen); shape of dorsal appendage and digitus is similar, but slightly different; leaf-like seta present in the holotype is not detectable in the present specimens; anal point in the present specimens has a very broad and long, triangular base reaching to near the base of anal tergite.

***Rhepelopia maculipennis* (Zetterstedt, 1838)**

A male was collected. No. 348: 56. BL 4.24mm, WL2.26mm, WW/WL 0.30, ER 0.32, AR 1.75, AHR 0.56, P/H 1.58 (very high), SO 24:24, CL 24, PN 10:10 (all lateral), DM 32,

DL 36:36, PA 25:25, SC 40, SQ22:22, RR 0.43, VR 0.90, R/Cu 1.11, fLR 0.87, mLR 0.63, hLR 0.77, fTR 0.13, fBR 4.6, mBR 6.7, hBR 7.7.

Body largely yellow, with brownish marks as illustrated in Figs. 16 c,e,k of Sasa & Okazawa (1992, p.229) with specimens collected in Toyama; median stripes with 2 brownish marks, femora with a preapical dark ring; abdominal tergites II to VIII each with a brownish transverse band (VII largely brown). Wings entirely clothed with macrotrichia and with 3 faint dark marks. Hypopygium as illustrated in Fig. 16 l of the same paper, gonocoxite with a pair of large triangular basal lobe. This species was recorded from Kyoto by Tokunaga (1937) with the name of *Pentaneura maculipennis*, and also described by Sasa & Okazawa (1992) from Toyama. This is the first record of this species from Hokkaido.

3. 4. At Fukidashi Park, Kyogoku, with insect net on September 6

Chironomus yoshimatsui Martin et Sublette, 1978; 2 males; No. 348: 67, 68.

Brillia longifurca Kieffer, 1921; 1 male; No. 348: 69.

Cricotopus metatibialis Tokunaga, 1936; 2 males; No. 348: 70, 71.

Cricotopus (Pseudocricotopus) montanus Tokunaga, 1936; 2 males; No. 348: 72, 73.

Paratrachocladus kyogokuprimus sp. nov.; 1 male; No. 348: 74; see Notes.

Limnophyes minimus (Meigen, 1818); 1 male; No. 348: 75.

Limnophyes akannonus Sasa et Kamimura, 1987; 1 male; No. 348: 76.

Syndiamesa kyogokusecunda sp. nov.; 1 male; No. 348: 77; see Notes.

Notes on the chironomid species collected at Kyogoku, Hokkaido

Paratrachocladus kyogokuprimus sp. nov. (Fig. A17)

A male was collected by sweeping with insect net. Holotype: No. 348: 74.

Male. BL 3.48mm, WL2.20mm, WW/WL0.31. Ground color of scutum brown, stripes dark brown, scutellum brown, postnotum dark brown, legs and abdomen almost evenly brown. Head in Fig. 17 a. Eyes entirely pubescent, with wedgeshaped dorsomedial extension, ER 0.65. Antenna with 13 flagellar segments, AR 0.57 (very small), AHR 0.39. Palp shorter than width of head, P/H 0.95. So composed of 1:2 median and 4:5 lateral groups. CL 8. Anteprepronotum (Fig. 17 b) narrowly united, with 1:1 lateral seta. Distribution of setae on scutum and scutellum in Fig. 17 c. DM absent, DL 6:8, the anterior two setae are short and the posterior setae long, all arising from large pale pits. PA 3:3, SC 26 in 3 transverse rows (very many).

Wing bare, bluish, very finely granular, venation in Fig. 17 d. Anal lobe nearly rectangular. Squama with 13:14 fringe hairs. Costa slightly extended beyond tip of R4+5, which is distal to tip of Cul, R/Cu 1.05. R2+3 separated, RR 0.53. VR 1.18. Cu2 nearly straight. Tip of front tibia (Fig. 17 e) with a long spur, tip of middle tibia (Fig. 17 f) with two spurs, tip of hind tibia (Figs. 22 g,h) with a long and a short spur, and a comb composed of 11 free sines. fLR 0.71, mLR 0.53, hLR 0.70, fTR 0.12, fBR 2.3, mBR 2.5, hBR 2.9. Tarsi with a pair of apically forked claws, an empodium but without pulvilli (Fig. 17 i, hind tarsus V).

Abdominal tergites (Fig. 17 j, left half) with relatively large numbers of setae dis-

tributed almost evenly excepting bare areas along midline, 50 on I, 66 on II, 58 on III and IV, 50 on V and VI, and 30 on VII abd VIII. Hypopygium in Fig. 17 k. Ninth tergite with 8 setae in the median area, with a pair of large rounded lobe on posterior margin, anal point and virga absent. Inner lobe of gonocoxite (also in Fig. 17 m) rather small, longer than wide and with rounded margin, bearing short setae. Gonostylus simple, with an acutely angulate preapical tooth and a long megaseta.

Remarks. This specimen is a typical member of the genus *Paratrichocladus* Santos Abreu, 1918, in that eyes are pubescent, dorsolateral setae are well developed and arising from large pale pits, squama fringed, costa slightly extended, R2+3 is separated, Cu2 nearly straight, R/Cu >1.0, and anal point is absent. It is somewhat related to *P. rufiventris* (Meigen, 1830) in that inner lobe of gonocoxite is small and conical, posterior margin of ninth tergite is concave medially, and gonostylus with an angulate preapical tooth, but in the latter inner lobe of gonocoxite has an accessory process, AR is larger than 1.0, DM present, DL 15–18 (larger), SC 12–14 (smaller). The present species is quite unusual as a member of this genus in that AR is 0.57 (usually larger than 1.0), DM absent, DL small and SC is large, and preapical tooth of gonostylus is acutely angulate.

***Syndiamesa kyogokusecunda* sp. nov.** (Fig. A 18)

A male was collected at Kyogokucho, Hokkaido, on September 6, 1997, by sweeping with insect net by Suzuki. Holotype: No. 348: 77.

Male. Bl 5.50mm, WL 3.00mm, WW/WL 0.30. Body almost entirely dark brown or black. Head in Fig. 18 a. Eyes bare, with wedge-shaped dorsomedial extension, ER 0.78. Antenna with 13 flagellar segments, AR 1.23, AHR 0.51, and with a prominent apical seta. P/H 1.11. SO 48:50 (very many), CL 24. Anteprenotum (Fig. 18 b) united in the middle, with 10:10 lateral setae. Distribution of setae on scutum and scutellum in Fig. 18 c. DM 0, DL 15:15, PA 6:6, SC 26.

Wing bare, not granular, venation in Fig. 18 d. Squama with more than 17 hairs, anal lobe almost rectangular. M-Cu slightly distal to FCu. Costa slightly extended beyond tip of R4+5. RR 0.65, VR 0.98, R/Cu 1.15. Cu2 curved near apex. Tip of front tibia (Fig. 18 e) with a relatively short spur, 76 microns long and 0.90 times as long as the diameter of front tibia at the tip. Tip of middle tibia (Fig. 18 f) with two spurs, 82 and 78 microns long. Tip of hind tibia (Figs. 23 g,h) with two spurs (114 and 86 microns), and a rather irregularly arranged comb composed of 20 free spines. Tips of tarsus I, II and III of middle and hind legs each with two simple spurs. All tarsi IV cylindrical, slightly longer than tarsi V. Claws simple, apically pointed, empodium present but pulvilli absent.

Abdominal tergites with large numbers of setae distributed almost evenly. Hypopygium in Figs 23 i, j. Anal point and virga absent, posterior margin of ninth tergite concave in the middle and with 12 short setae, and a broad and rounded lobe bearing no setae. Inner lobe of gonocoxite broad and quadrangular, situated in the posterior portion, bearing many short setae. Gonostylus simple, inner margin broadly convex and widest at about middle, with a large megaseta apically.

Remarks. This specimen belongs to the genus *Syndiamesa* Kieffer, 1918, since wing bare and M-Cu is slightly distal to FCu, eyes with dorsomedial extension and $ER < 1.0$, antepronotum united in the middle and with only lateral setae, tarsi IV cylindrical and longer than tarsi V, inner verticals present and palpal segment III without apical extension. It is somewhat related to *S. yosiii* Tokunaga, 1964, in that tarsi I, II and III with terminal spurs, IV cylindrical and longer than V, anal point absent, tarsi without long beards, and gonocoxite with an inner lobe, but is essentially different from it in that inner lobe of gonocoxite is situated near apex, AR is much smaller (2.67 in *S. yosiii*), and gonostylus is strongly expanded in the middle.

3.5. On the foot of Mount Tarumae, by sweeping with insect net, on September 7

Microsectra yunoprime Sasa, 1984; 5 males; No. 348: 81–85.

Pentapedilum kasumiense Sasa, 1979; 1 male; No. 348: 86.

Polypedilum (Uresipedilum) aviceps Townes, 1946; 2 males; No. 348: 87, 89.

Cricotopus (Pseudocricotopus) montanus Tokunaga, 1936; 3 males; No. 348: 89–91.

Part B. The chironomid species collected in northern Honshu

B1. The chironomid species collected in the Aizu area, Fukushima

Collections of adult chironomids were conducted again by M. Sasa in October 1997, at three localities in the Aizu area, and the following species were identified.

B 1.1. At Koriyama Grand Hotel, on October 22, 1997, by night collection of adults attracted on fluorescent lamps with sucking tubes.

Orthocladius glabripennis (Goetghebuer, 1921); 1 male; No. 347: 01.

Polypedilum tamanigrum Sasa, 1983; 1 male; No. 347: 02.

B 1.2. On the shore of Lake Inawashiro, on October 23, 1997, by night collection of adults on fluorescent lamps.

Chironomus nipponensis Tokunaga, 1940; 1 male; No. 347: 03.

Paratrichocladius rufiventris (Meigen, 1830); 1 male; No. 347: 04.

Limnophyes tamakitanoides Sasa, 1981; 1 male; No. 347: 05.

Protanypus sp.; 1 male; No. 347: 06; see Notes.

B 1.3. On the shore of Lake Hibara, on October 24, daytime collection of adults with insect net.

Endochironomus hibaradecimus sp. nov.; 1 male; No. 347: 07; see Notes.

Psectrocladius yunoquartus Sasa, 1984; 1 male; No. 347: 08.

Limnophyes minimus (Meigen, 1818); 1 male; No. 347: 09.

Pseudosmittia hibaraundecima sp. nov.; 1 male; No. 347: 10; see Notes.

Notes on the chironomid species collected in the Aizu area

Endochironomus hibaradecimus sp. nov. (Fig. B1)

A male was collected with insect net on the shore of Lake Hibara on October 24, 1997.

Holotype: No. 347: 07.

Male. Large midge with BL 8.56mm, WL 4.47mm, WW/WL 0.25 (very narrow). Ground color of scutum brown, stripes black, scutum with a pair of small oval pale areas on the lateral margin near the posterior corner, where superior setae are arising; scutellum yellowish brown, postnotum black; femora largely brown and each with a preapical pale ring and an apical dark ring, tibiae largely brown and with a basal and an apical dark brown rings, tarsi I largely brown and with an apical dark ring, tarsi II to V almost uniformly brown; abdominal tergites largely black, VI to VIII each with a narrow caudal pale band. Wing with a small dark area around cross vein R-M, otherwise pale.

Head in Fig. 1 a. Antenna lost. Frontal tubercles absent. Eyes bare, ER 0.40. Palp long, P/H 1.22. SO 18:18, CL 50. Anteprepronotum (Fig. 1 b) tapering towards middle and separated by a narrow and deep groove, without seta. Distribution of setae on scutum and scutellum in Fig. 1 c; DM 14 in double row; DL 22:23 in a single row excepting the caudal 4 setae in double rows; PA 8:9 arising from a pale area; SC 34 in multiple rows.

Wing bare, bluish in transmitted light, venation in Fig. 1 d. Costa not extended. R₂+3 separated, RR 0.36. VR 0.97 (FCu proximal to R-M). R/Cu 1.15. Squama with 42: 42 fringe hairs. Anal lobe nearly rectangular. Terminal scale of front tibia (Fig. 1 e) with rounded margin and bearing 4 long setae. Terminal comb scale of middle and hind tibiae (Figs. 1 f, g) low and contiguous, without spur. fLR 1.13 (relatively small), mLR 0.61, hLR 0.71, fTR 0.21, fBR 9.0 (tarsus I with very long beards), mBR 1.9 (very small), hBR 4.4. Tarsus V (Fig. 1 h, front leg) with a pair of long and apically pointed claws, an empodium, and a pair of brush-like pulvilli.

Abdominal tergites with very many setae (more than 100 on II to VI). Hypopygium in Fig. 1 i. Anal point long, slender, nearly parallel-sided and apically rounded. Dorsal appendage (also in Fig. 1 j) composed of a low base bearing 9 inner setae, and a long, nearly straight but apically hooked distal horn without lateral seta. Ventral appendage long, slender, not apically expanded, and bearing 3 long, caudally directed setae each arising from a tubercle, some 20 long orally directed setae along almost entire length of inner margin, and 15 short setae on dorsal side. Gonocoxite long, longer than gonostylus, the latter nearly parallel-sided and bearing numerous short setae on inner and dorsal surface.

Remarks. This specimen is considered as belonging to the genus *Endochironomus* Kieffer, 1918, since anteprepronotum is separated in the middle and the structures of anal point, dorsal and ventral appendages, gonocoxite and gonostylus are coincident with the previously known species of this genus. The body coloration, and the shape of dorsal appendage is similar to that of *E. inpar* (Walker, 1856). However, it is quite unusual as a member of this genus in that wing with a dark area around R-M, terminal comb scales of middle and hind tibiae without spur, and gonocoxite is much longer than gonostylus.

***Pseudosmittia (Hibarasmittia) hibaraundecima* subg. et sp. nov. (Fig. B2)**

A male was collected on the shore of Lake Hibara on October 24, 1997. Holotype: No. 347: 10.

Male. BL 2.38mm, WL1.66mm, WW/WL 0.29. Ground color of scutum brown, stripes dark brown and humeral areas are slightly paler, scutellum brown, postnotum dark brown, halteres, legs and abdomen brown. Head in Fig. 2 a. Eyes bare, reniform and without dorsomedial extension, ER 1.48. Antenna with 13 flagellar segments, without apical seta, AR 1.02, AHR 0.56. P/H 0.98. SO 6:6, CL 6. Antepronotum (Fig. 2 b) very narrow, tapering towards middle and slightly separated, with 1:1 lateral seta. Distribution of setae on scutum and scutellum in Fig. 2 c; DM absent, scutum without central pale area; DL 8:8, PA 3:3, SC 4.

Wing in Fig. 2 d; wing membrane bare, brownish and very finely granular; squama bare, anal lobe nearly flat; R2+3 separated, RR 0.36; costa not extended; FCu far distal to R-M, VR 1.35; tip of R4+5 distal to tip of Cul, R/Cu 1.11; Cu2 short and strongly curved at about middle. Tip of front tibia (Fig. 2 e) with a long spur, 50 microns long and 1.8 times as long as the diameter of front tibia at the tip. Tip of middle tibia (Fig. 2 f) with two short spurs. Tip of hind tibia (Fig. 2 g) with a long and a short spur, and a comb composed of 14 free spines. Pulvilli absent (Fig. 2 h, front tarsus V).

Abdominal tergites (Fig. 2 i) with relatively small numbers of setae, 12 on I, 24 on II, 28 on III, 26 on IV, 22 on V and VI, and 16 on VII and VIII. Hypopygium in Fig. 2 j. Anal point is represented by a low longitudinal, darkly pigmented ridge on the midline of ninth tergite. Ninth tergite with 4 and 5 setae on both sides of the anal point. Virga (Fig. 2 k) composed of two stout codes crossing each other, 18 and 12 microns long. Gonocoxite with two inner lobes (Fig. 2 m), the dorsal one small, semicircular and bare, the ventral one very broad, semicircular, bearing microtrichia and marked with netlike patterns. Gonostylus large, lateral margin rectangularly produced (quite characteristic), and bearing a large megaseta.

Remarks. This species is especially characteristic in the structure of gonostylus, which is rectangularly shaped and quite similar to that of the genus *Bisaiyusurika* Sasa et Kondo, 1994. Three species have been recorded as members of this genus, all only from Japan, *i. e.* *B. kameii* (Sasa, 1989), *B. kisorectangulata* Sasa et Kondo, 1994, and *B. gunmatertia* Sasa et Kawai, 1996. However, all the above three previously known species of this genus show the wing patters of the *Orthocladius* complex, namely squama fringed and Cu2 is straight, while in the present species squama is bare, Cu2 is strongly curved and costa is not extended, representing a pattern of the genus *Pseudosmittia* Goetghebuer, 1932. On the other hand, some species belonging to this genus in the structure of wing have forked gonostylus like figure V, and was separated as the subgenus *Nikismittia* Sasa, 1998 from the subgenus *Pseudosmittia* s. str. Therefore, a new subgenus, *Hibarasmittia*, is created with the present species, *P. hibaradecimus* sp. nov. as the type species. This new subgenus is especially characterised by having general structures typical as a member of genus *Pseudosmittia* but the gonostylus is rectangularly shaped.

***Protanypus* sp. "Inawa."** (Fig. B3)

A male was collected on light on the shore of acid and rather eutrophicated lake Inawashiro on October 23, 1997. No. 347: 06.

Male. BL 5.62mm, WL 3.74mm, WW/WL 0.27. Body almost entirely black, legs dark brown but proximal and distal portions of tibiae black. Head in Fig. 3 a. Eyes bare, reniform and without dorsomedial extension, ER 1.44. Antenna with 13 flagellar segments, last segment not divided like in that of Tanypodinae, AR 1.95, AHR 0.69. Palp about as long as the width of head, P/H 1.01. Temporal setae numerous, consisting of 14 inner and 16 outer groups on both sides. Clypeal setae absent (an unusual character). Anteprenotum (Fig. 3 b) united in the middle, with 10 dorsal and 12 lateral setae on both sides. Distribution of setae on scutum and scutellum in Fig. 3c. DM24, DL 24:24, PA 10:10, SC 16.

Wing bare, very finely granular, squama with 78 fringe hairs, anal lobe strongly produced inwards, venation in Fig. 3 d. Costa slightly extended beyond tip of R4+5. R2+3 separated and not forked, RR 0.52. Cross vein M-Cu present, distal to FCu. R-M situated distal to FCu, VR 0.83. Tip of R4+5 much distal to tip of Cul, R/Cu 1.18. Cu2 strongly curved near apex. Tip of front tibia (Fig. 3 e) with a long and basally barbed spur, 102 microns and 1.3 times as long as the diameter of front tibia at the tip. Tip of middle tibia (Fig. 3 f) with two relatively long basally barbed spurs, 64 and 100 microns long. Hind tibia with a long and a shorter terminal spur, and numerous spines distributed in the distal portion (these spines are not arranged into a terminal comb; Fig. 3 g). fLR 0.72, mLR 0.51, hLR 0.55, fTR 0.08, fBR 2.7, mBR 3.4, hBR 3.6. Tarsi IV cylindrical, longer than tarsi V, pulvilli vestigial.

Abdominal tergites with large numbers of setae almost evenly distributed, 136 on tergite II, 124 on III, and 126 on IV. Hypopygium in Fig. 3 h. Ninth tergite roughly quadrangular, anal point absent. Gonocoxite very long, tapering towards apex, inner lobe absent. Gonostylus in attached to about middle of gonocoxite, and the part of gonocoxite posterior to gonostylus is just 200 microns and 1.09 times as long as gonostylus, which is 184 microns long. Gonostylus simple and tapering towards apex, with numerous short setae, and a small megaseta at the tip, microtrichia apparently absent from its outer surface.

Remarks. This specimen belongs to the subfamily Diamesinae, since cross vein M-Cu present and simple, and situated distal to FCu. It further belongs to the genus *Protanypus* Kieffer, 1906, as anteprenotum bearing a group of dorsal setae, and gonostylus is attached to about middle of gonocoxite. Although it was stated by Brundin (1956, p. 61) that this genus was distributed from Europe eastwards to Japan, I cannot find any literature referring to its record from Japan. A total of 6 species were recorded by Saether (1975) as members of this genus from the Nearctic and Palaearctic Regions, and the present specimen fit only to *P. caudatus* Edwards according to the key presented in this apper. This is a species recorded only from strongly oligotrophic Fennoscandinavian lakes, and since no additional information referring to it is available to the authors, the scientific name of this specimen is provisionally reserved.

B2. The chironomid species collected in Aomori Prefecture

Studies on the chironomids in the Lake Towada area, Aomori, were conducted in June-July 1989 by Sasa (1991), and a total of 29 species, including 10 new species, were

recorded. Night collections with a light trap were conducted this time by Dr. Kiyoshi Kamimura in August 1997 at three localities in Aomori Prefecture, northern Honshu, and the following species were identified.

B2. 1. At Sukayu Hotspring town, on August 6, 1997

Chironomus acerbiphilus Tokunaga, 1939; 2 males; No. 347: 13, 14.

Macropelopia sukayusecunda sp. nov.; 1 male; No. 347: 15; see Notes.

Remarks. Sukayu is a hotspring town in Aomori, and in a daytime collection with insect net made by Sasa (1991a, p. 79) on July 1, 1989, at the side of a stream accepting the strongly acidic hotspring, 3 chironomid species were recorded, *Chironomus acerbiphilus* Tokunaga, 1939, *Polypedilum sukayuprimum* Sasa, 1991, and *Polypedilum tamanigrum* Sasa, 1983.

B2.2. At Asamushi, Aomori, on August 7, 1997

Polypedilum arundineti Goetghebuer, 1921; 3 males; No. 347: 16–18.

Ablabesmyia monilis (Linnaeus, 1763); 2 males; No. 347: 19, 20.

B2.3. At Fukaura, Aomori, on August 1, 1997.

Dicrotendipes nervosus (Staeger, 1839); 1 male; No. 347: 21.

Polypedilum cultellatum Goetghebuer, 1931; 1 male; No. 347: 22.

Tanytarsus kamimurai sp. nov.; 1 male; No. 347: 23; see Notes.

Notes on the species collected in Aomori Prefecture

***Tanytarsus kamimurai* sp. nov. (Fig. B4)**

A male was collected at Fukaura, Aomori, with a light trap by Dr. Kiyoshi Kamimura, on August 1, 1997. Holotype: No. 347: 23.

Male. BL 2.22mm, WL 1.34mm, WWWL 0.31. Body almost entirely yellow, scutal stripes hardly discernible. Head in Fig. 4 a. Eyes bare, ER 0.68. Antenna with 13 flagellar segments, AR 0.68, AHR 0.41. Palp long, P/H 1.42 SO 10:10, CL 12. Frontal tubercles (Fig. 4 b) prominent, spindle-shaped and apically pointed, 40 microns long, 13 microns wide at the base, and 41 microns apart from each other. Antepnotum (Fig. 4 c) widely separated, without lateral seta. Distribution of setae on scutum and scutellum in Fig. 4 d. DM 10, DL 8:9, PN 1:1, SC 5.

Wing in Fig. 4 e. Squama bare, anal lobe nearly flat, membrane with macrotrichia almost on entire surface. Costa not extended, R1 and R4+5 very closely running, cross vein R-M almost parallel to wing axis. RR 0.46, VR 1.33, R/Cu 1.07. Tip of front tibia (Fig. 4 f) with a narrow and sharply pointed spur. Tips of middle and hind tibiae (Figs. 4 g,h) with two comb scales, one with a long spur, the other without spur. Tarsi of all legs lost.

Hypopygium in Fig. 4 i. Bands of ninth tergite united in the middle, forming a figure T. Anal point (also in Fig. 4 j) narrow and slightly tapered towards apex, lateral ridges inconspicuous, with a pair of spine clusters in the middle, which are connected by a U-shaped bridge. Ninth tergite with a pair of ridges at the base of anal point, and 20 spine clusters proximal to the base of anal point, a very peculiar structure. Dorsal appendage (Fig. 4 k) roughly oval but posterior margin slightly concave near apex, bearing 11 setae on dorsal side.

Digitus (Fig. 4 m) is attached on ventral side of dorsal appendage, extending beyond inner margin of dorsal appendage, apically rounded. Median appendage (Fig. 4 n) relatively short and with numerous simple setae. Ventral appendage (Fig. 4 n) finger-like, with 4 recurved setae on inner side and 5 setae on lateral side of apical portion. Gonostylus narrow, nearly parallel-sided and longer than gonocoxite.

Remarks. This specimen belongs to the *mendax* group of genus *Tanytarsus* van der Wulp, since anal point with lateral setae and spine clusters, digitus is long, and setae on median appendage is relatively short and does not reach to beyond middle of ventral appendage. This species is characteristic in the structure of anal point and in the distribution of spine clusters on and around it. It is somewhat related to *T. shoudigitatus* Sasa, 1989, in that frontal tubercles are prominent, anal point is slender and parallel-sided, dorsal appendage is elongate oval, and median appendage is short and with simple setae only, but latter differs from the present species remarkably in that body is entirely pale yellow, frontal tubercles are cylindrical, AR is 0.94–1.08, anal point with 4 spine clusters at about equal distance on the shaft but not at its base, and bands of ninth tergite are separated in the middle.

***Macropelopia sukayusecunda* sp. nov.** (Fig. B5)

A male was collected by Dr. K. Kamimura with a light trap at the side of the acid hot spring in Sukayu, Aomori, on August 6, 1997. Holotype: No. 347: 15.

Male. BL 4.98mm, WL 2.70mm, WW/WL 0.28. Ground color of scutum yellowish brown, stripes brown, scutellum yellow, postnotum brown; femora largely dark brown and each with an apical narrow yellow ring, tibiae largely yellow and with a narrow apical brown ring, tarsi largely yellow; abdominal tergite I with oval brown areas in the anterior portions, II to IV largely yellow and each with a median and a pair of lateral oval brown areas, V to VIII largely brown and with yellow bands on oral and caudal margins, hypopygium brown. Wing without dark marks.

Head in Fig. 5 a. Eyes bare, each with a long and narrow dorsomedial extension, ER 0.33. Antenna with 14 flagellar segments, AR (ratio of the length of the last two segments divided by the length of the preceding 12 segments) 2.04, AHR 0.56. Palp long, P/H 1.40. SO 40:40, CL 19. Anteprepronotum (Fig. 5 b) tapering towards middle and widely separated, with 16:16 lateral setae. Distribution of setae on scutum and scutellum in Fig. 5 c. DM 81, DL 80:83, PA 32:33, SC 65. Scutum with a small, triangular and darkly pigmented hump on the midline.

Wing thickly clothed with macrotrichia on entire surface, anal lobe strongly produced inwards, without any dark areas, venation in Fig. 5 d (macrotrichia omitted). SQ 60:64. Costa extending much beyond tip of R4+5. R2+3 separated and branched, RR 0.46. VR 0.83, R/Cu 1.16. R-M slightly distal to FCu. Tip of front tibia (Fig. 5 e) with a long barbed spur. Tip of middle tibia (Fig. 5 f) with two barbed spurs. Tip of hind tibia (Figs. 5 g, h) with two barbed spurs, and a comb composed of 12 free spines. Front and hind tarsi lost, mLR 0.61, mBR 4.1. Pulvilli absent.

Hypopygium in Fig. 5 i. Ninth tergite low and broad, anal point absent. Gonocoxite

without inner lobe, and with numerous setae on dorsal and inner surface. Gonostylus simple, less than half the length of gonocoxite, with a large megaseta apically.

Remarks. This is a member of the genus *Macropelopia* Thienemann, 1916, since wing with macrotrichia, cross vein M-Cu is distal to FCu, costa extended, postnotum with a double row of bristles medially, tibial spurs are slender and with numerous teeth, pulvilli absent, claws pointed distally, and scutum with a median hump. Most of the previously known species of this genus have dark marks on the wing, and only *M. goetghebuveri* (Kieffer, 1918) has only one dark area around cross vein R-M, but the present species is completely devoid of dark areas on wing. In the previously known species of this genus apex of femora, tibiae and tarsomeres are darker, but in the present species femora are largely dark and with pale apex, tibiae are largely pale and apically darker.

ACKNOWLEDGEMENTS

Thanks are due to Professor Masao Kamiya, and Mr. Shinji Suzuki and other members of the Graduate School of Veterinary Medicine, Hokkaido University, for many assistances in the collection of materials and publication of this paper. We are also greatly indebted to Dr. Kiyoshi Kamimura for collecting the chironomid specimens from Aomori Prefecture used in the present studies, and to Ms. Miyoko Takagi and Mr. Hidebumi Tanaka of this Institute, for many assistances in publishig this report.

REFERENCES

- 1) Brundin, L. (1956): Zur Zystgematik der Orthocladiinae. Rep. Inst. Freshwat. Res. Drottingholm., 37, 5–185.
- 2) Edwards, F. W. (1929): British non-biting midges. Trans. Roy. Entom. Soc. London 77, 279–429.
- 3) Fittkau, E. J., Reiss, F. & Hoffrichter, O. (1976): A bibliography of Chironomidae. Gunneria, 1–177
- 4) Kikuchi, M. & Sasa, M. (1990): Studies on the chironomid midges of the Lake Toba area, Sumatra, Indonesia. Jpn. J. Sanit. Zool., 41, 291–329.
- 5) Pinder, L. C. V. (1978): A key to adult males of British Chironomidae. Freshwat. Biol. Assoc. Sci. Publ. No. 37(1), pp. 1–169, (2) Fig. 189.
- 6) Saether, O. A. (1975): Two new species of *Protanypus* Kieffer, with keys to Nearctic and Palaearctic species of the genus. J. Fish. Res. Board Canada 32, 367–388.
- 7) Sasa, M. (1985): A report on the chironomids collected in winter from the Sapporo area, Hokkaido. Res. Rep. NIES 83, 1–23.
- 8) Sasa, M. (1988a): Studies on the chironomid midges collected from lakes and streams in the southern region of Hokkaido. Res. Rep. NIES 121, 8–76.
- 9) Sasa, M. (1988b): Chironomid midges collected on the shore of lakes in the coastal region of Abasiri, northern Hokkaido. Res. Rep. NIES 121, 77–90.
- 10) Sasa, M. (1991): Studies on the chironomids of the Lake Towada area, Aomori. Res. Rep. TPEP, 1991. Pt. 2, pp. 68–83.

- 11) Sasa, M. (1993): Studies on the chironomid midges collected from lakes in the Aizu Region, Fukushima. Res. Rep. TPES 1993, Pt. 5, 69–95
- 12) Sasa, M. (1998): Chironomidae of Japan, 1998; List of species recorded, and supplemental keys for identification. Res. Rep. Inst. Envir. Welfare Stud. 1998a, 156 pp.
- 13) Sasa, M. & Kamimura, K. (1987): Chironomid midges collected on the shore of Lakes in the Akan National Park, Hokkaido. Sci. Rep. NIES 104, 9–61.
- 14) Sasa, M. & Kikuchi, M. (1995): Chironomidae of Japan. Univ. Tokyo. Press, 333 pp.
- 15) Sublette, J. E. & Sasa, M. (1994): Chironomidae collected in onchocerciasis endemic area of Guatemala. Spixiana Suppl. 20, 1–60

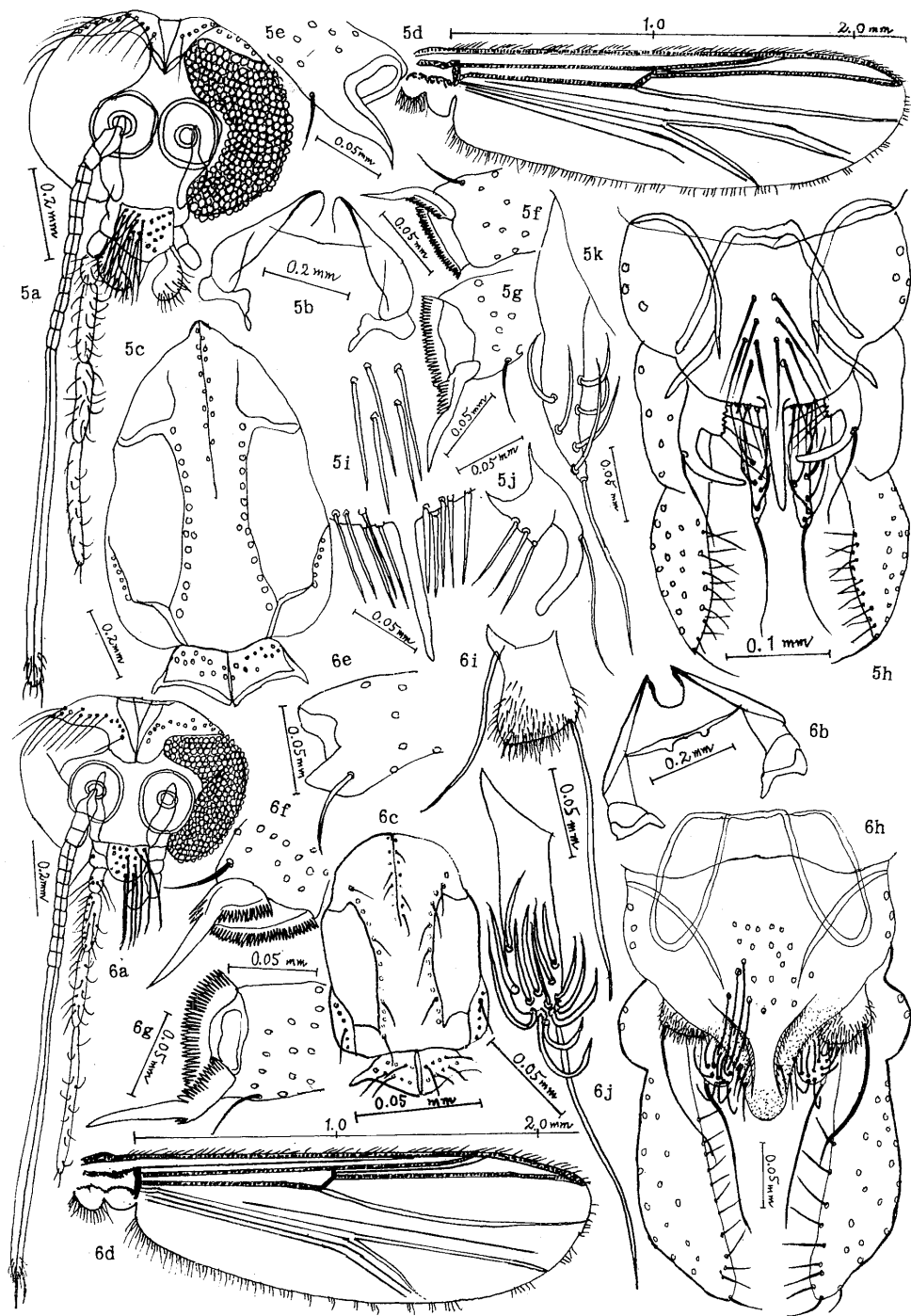


Fig. A5. *Polypedilum (Polypedilum) ginzanprimum* sp. nov.

Fig. A6. *Polypedilum (Tripodura) ginzansecundum* sp. nov.

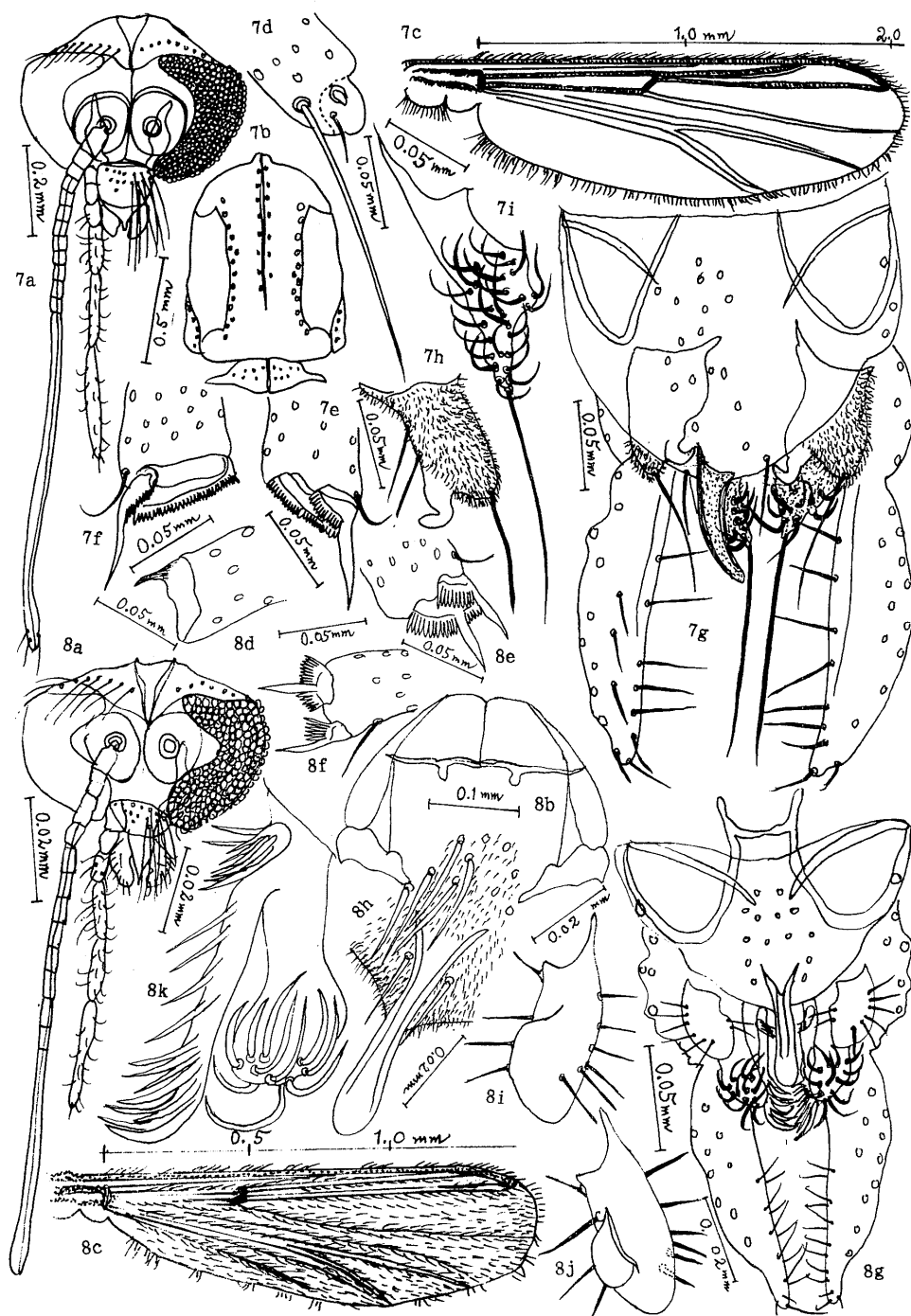


Fig. A7. *Polypedilum (Uresipedilum) ginzantertium* sp. nov.

Fig. A8. *Tanytarsus ginzanquartus* sp. nov.

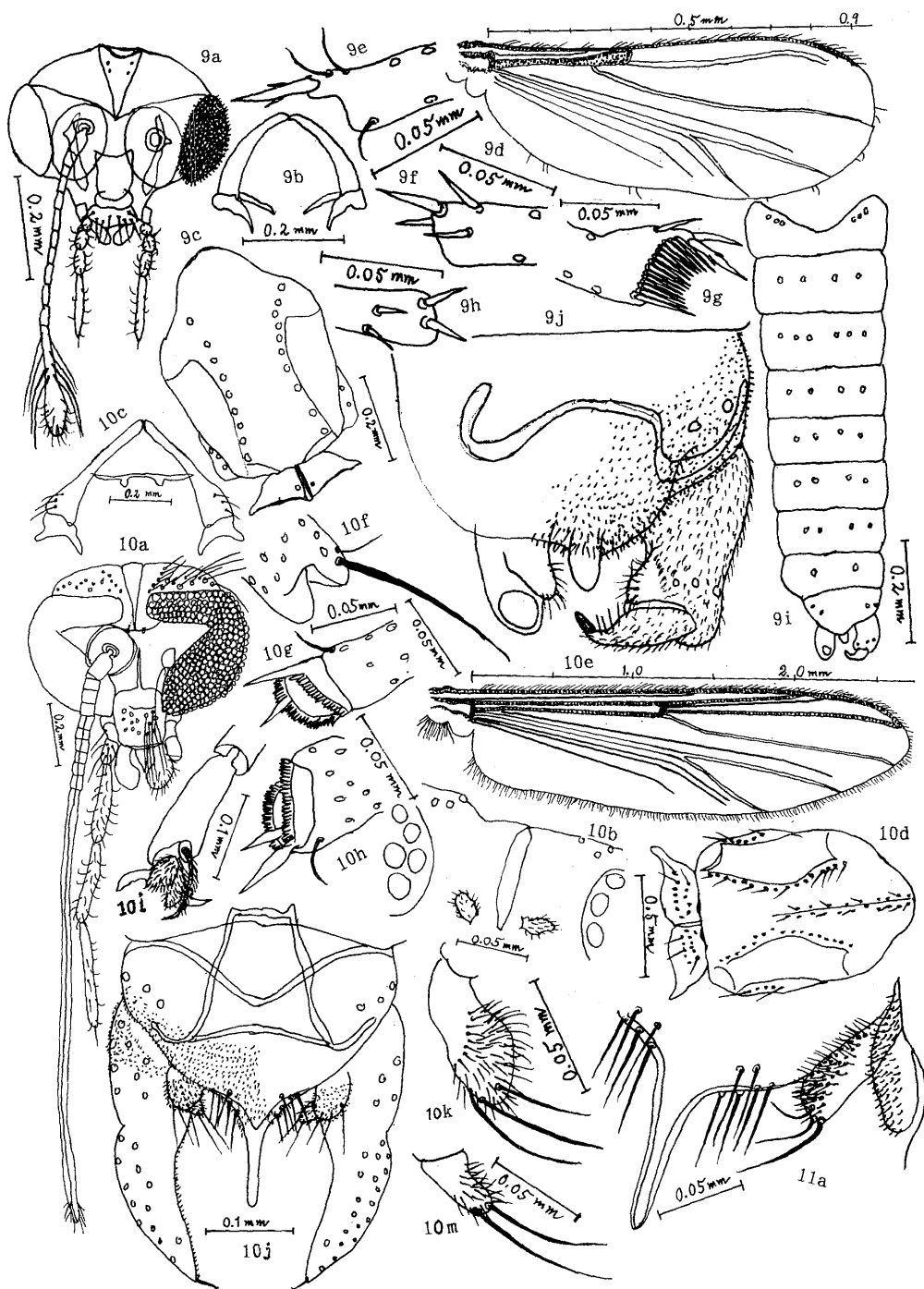


Fig. A9. *Corynoneura ginzanquinta* sp. nov.

Fig. A10. *Paracladopelma misumaiprima* sp. nov.

Fig. A11. *Paracladopelma* sp. "misumaisecunda"

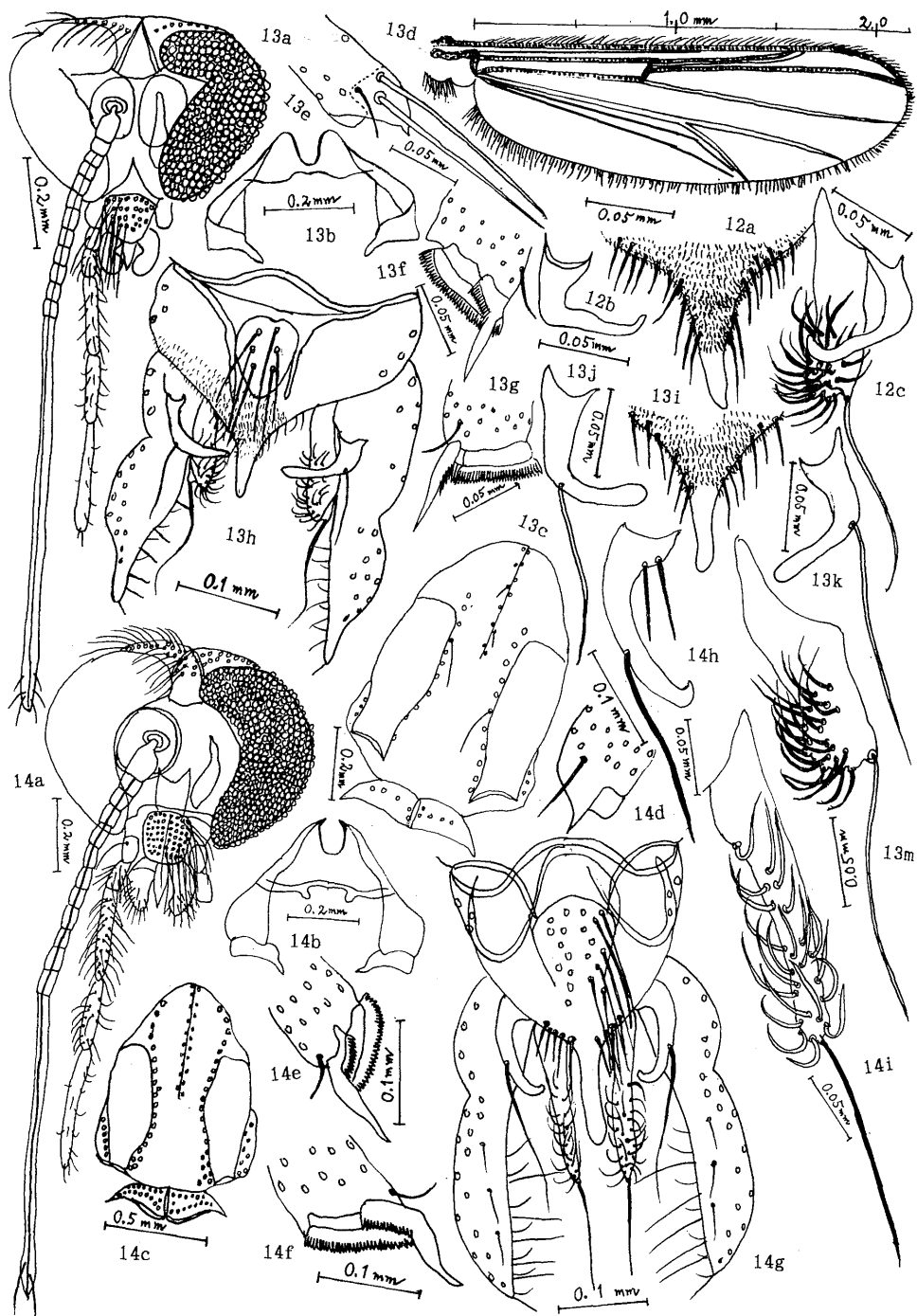


Fig. A12. *Polypedilum (Polypedilum) asakawaense* Sasa, 1980

Fig. A13. *Polypedilum (Polypedilum) misumaitertium* sp. nov.

Fig. A14. *Polypedilum (Polypedilum) misumaiquartum* sp. nov.



Fig. A15. *Stictochironomus pictulus* (Meigen, 1830)

Fig. A16. *Tanytarsus shoucygneus* Sasa, 1989

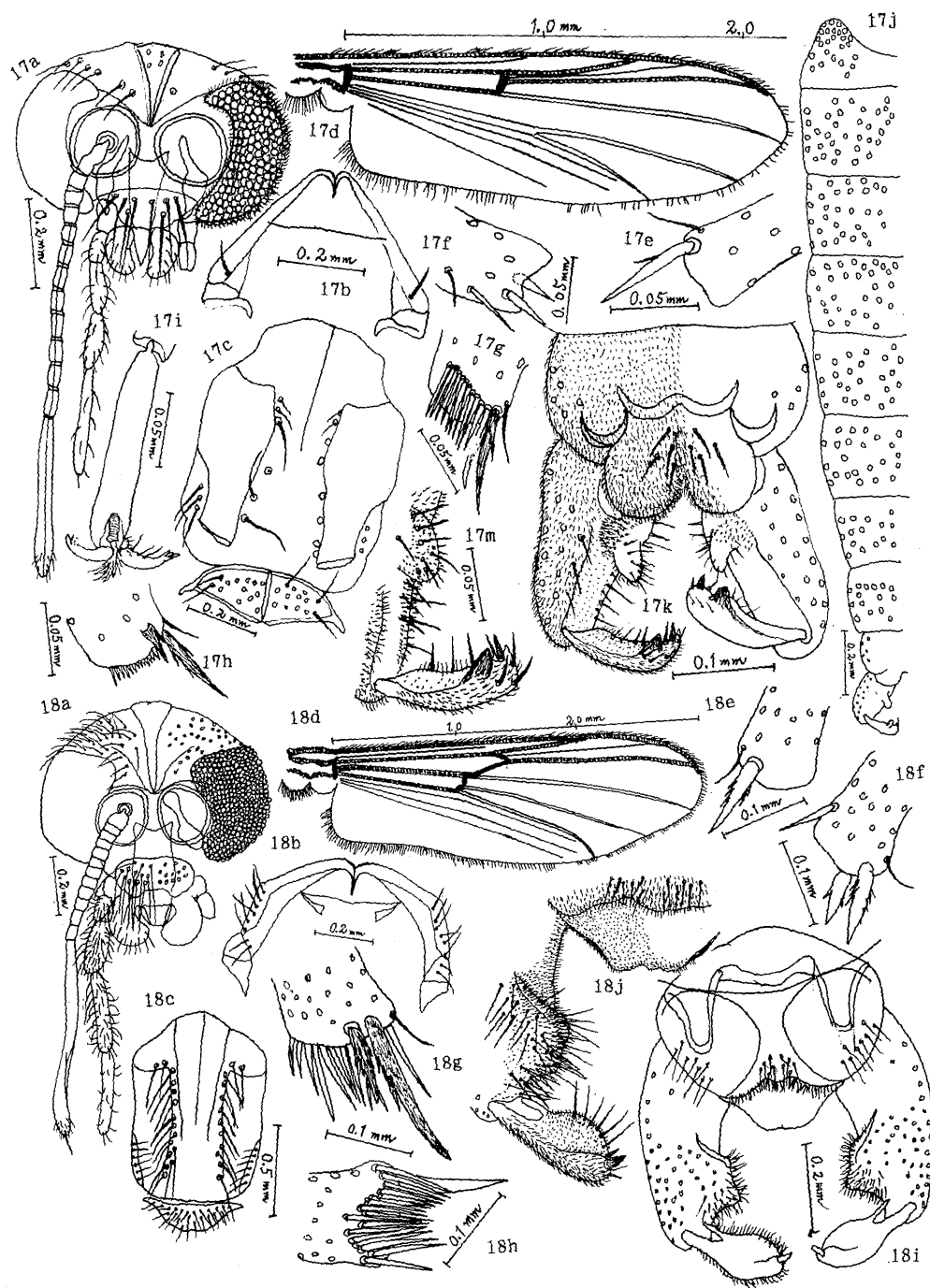
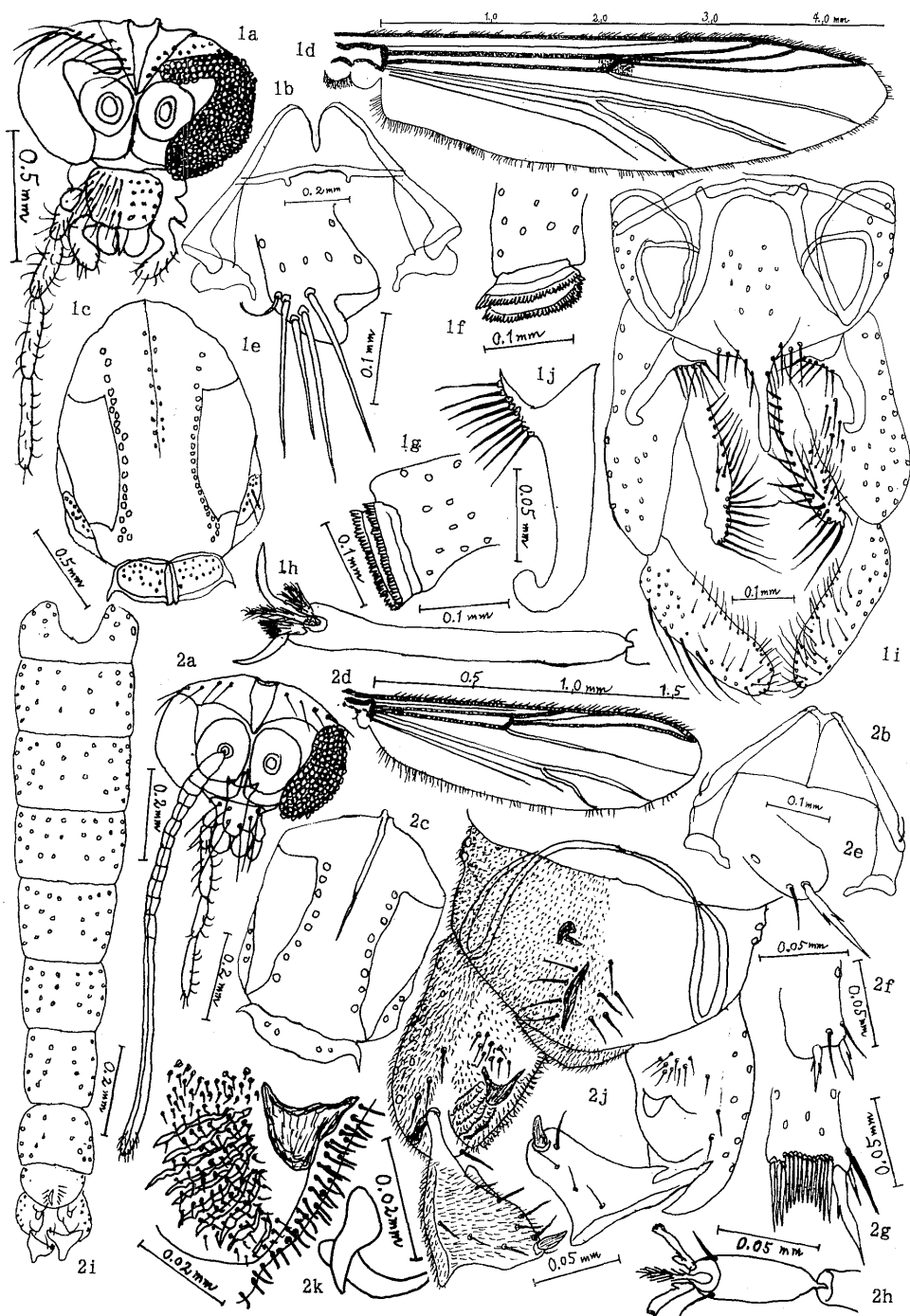
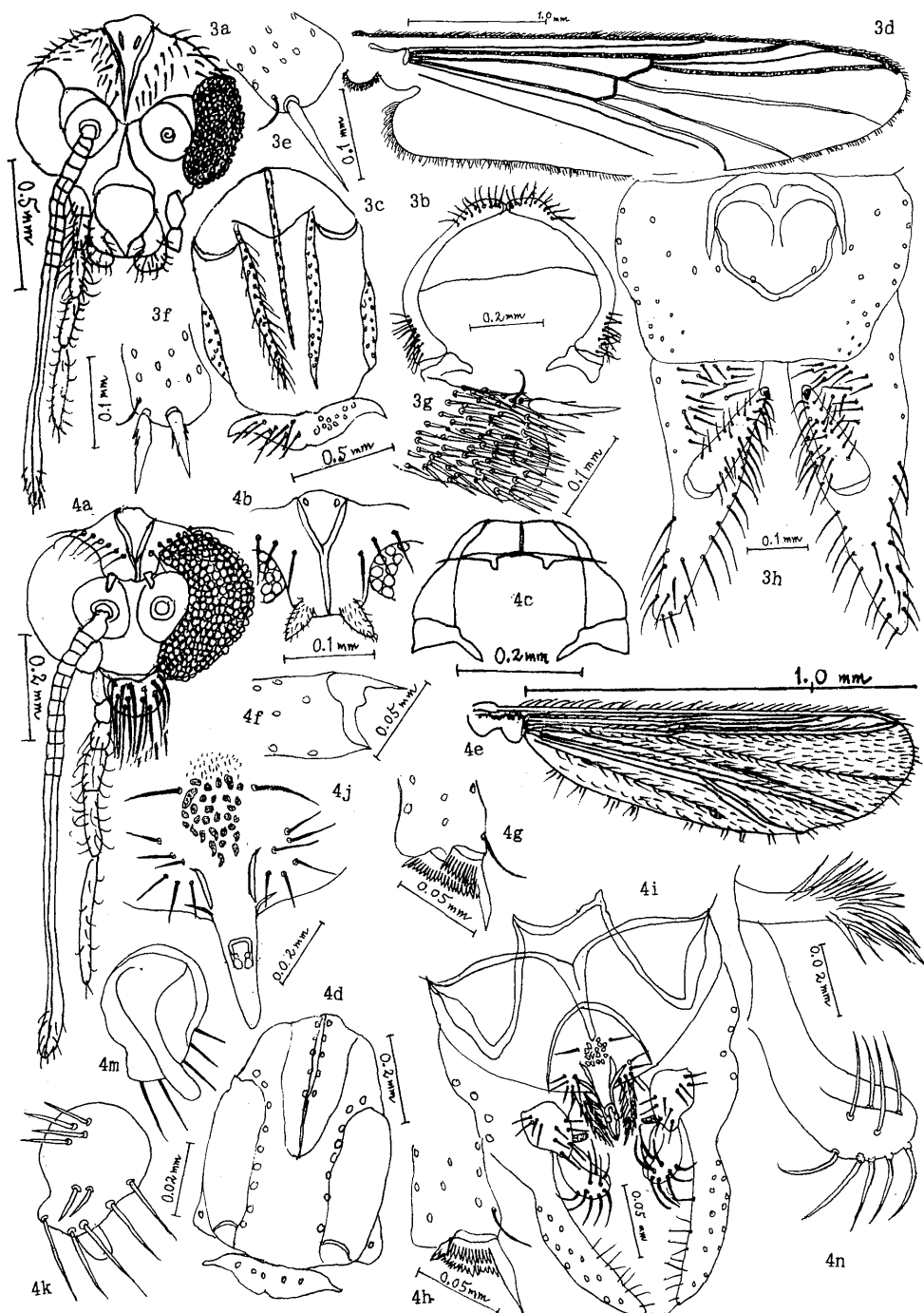


Fig. A17. *Paratrachocladus kyogokuprimus* sp. nov.

Fig. A18. *Syndiamesa kyogokusecunda* sp. nov.

B. Species collected in northern Honshu

Fig. B1. *Endochironomus hibaradecimus* sp. nov.Fig. B2. *Pseudosmittia hibaraundecima* sp. nov.

Fig. B3. *Protanytus* sp. "Inawa".Fig. B4. *Tanytarsus kamimurai* sp. nov.

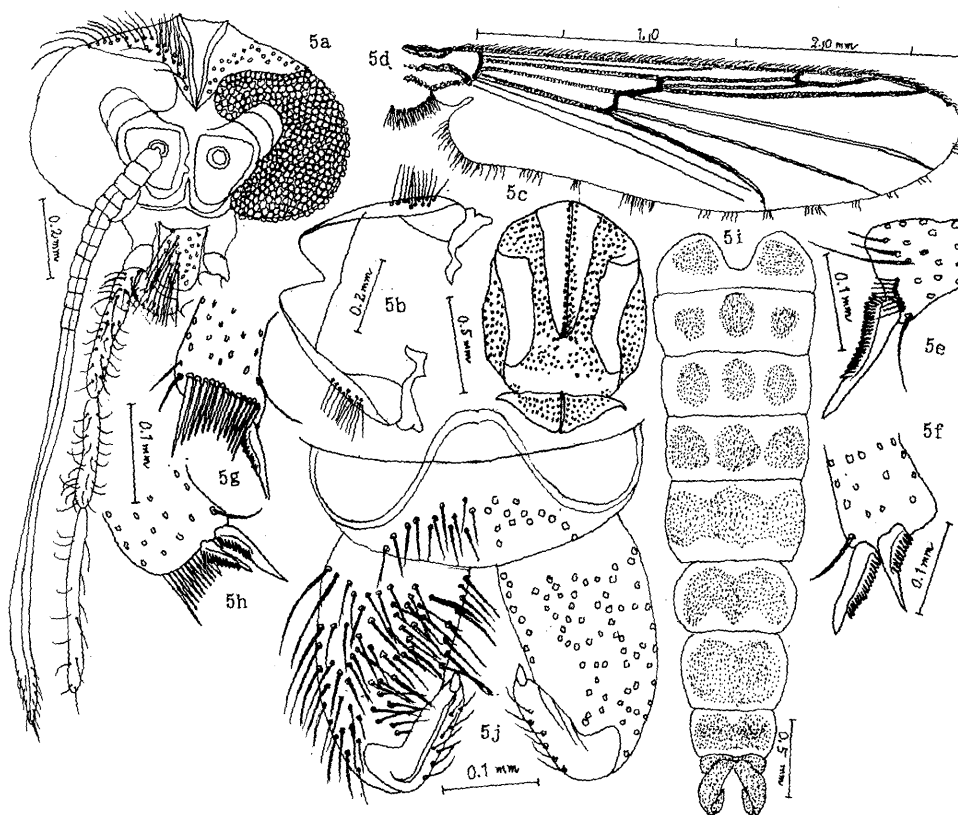


Fig. B5. *Macropelopia sukayusecunda* sp. nov.

B. Species collected in northern Honshu

Fig. B1. *Endochironomus hibaradecimus* sp. nov. a: head. b: anteprenotum. c: scutum and scutellum. d: wing. e: tip of front tibia. f: tip of middle tibia. g: tip of hind tibia. h: front tarsus V. i: hypopygium. j: dorsal appendage. **Fig. B2.** *Pseudosmittia hibaraundecima* sp. nov. a: head. b: anteprenotum. c: scutum and scutellum. d: wing. e: tip of front tibia. f: tip of middle tibia. g: tip of hind tibia. h: front tarsus V. i: distribution of setae on abdominal tergites. j: hypopygium. k: virga. m: inner lobes of left gonocoxite. **Fig. B3.** *Protanytus* sp. "Inawa". a: head. b: anteprenotum. c: distribution of setae on scutum and scutellum. d: wing. e: tip of front tibia. f: tip of middle tibia. g: tip of hind tibia. h: hypopygium. **Fig. B4.** *Tanytarsus kamimurai* sp. nov. a: head. b: frontal tubercles. c: anteprenotum. d: distribution of setae on scutum and scutellum. e: wing. f: tip of front tibia. g: tip of middle tibia. h: tip of hind tibia. i: hypopygium. j: anal point. k: dorsal appendage and digitus, dorsal view. m: do, ventral view. n: median and ventral appendages. **Fig. B5.** *Macropelopia sukayusecunda* sp. nov. a: head. b: anteprenotum. c: distribution of setae on scutum and scutellum. d: wing. e: tip of front tibia. f: tip of middle tibia. g,h: tip of hind tibia. i: dark areas on abdominal tergites. j: hypopygium.